AMERICAN ARTISAN

NOVEMBER 1940

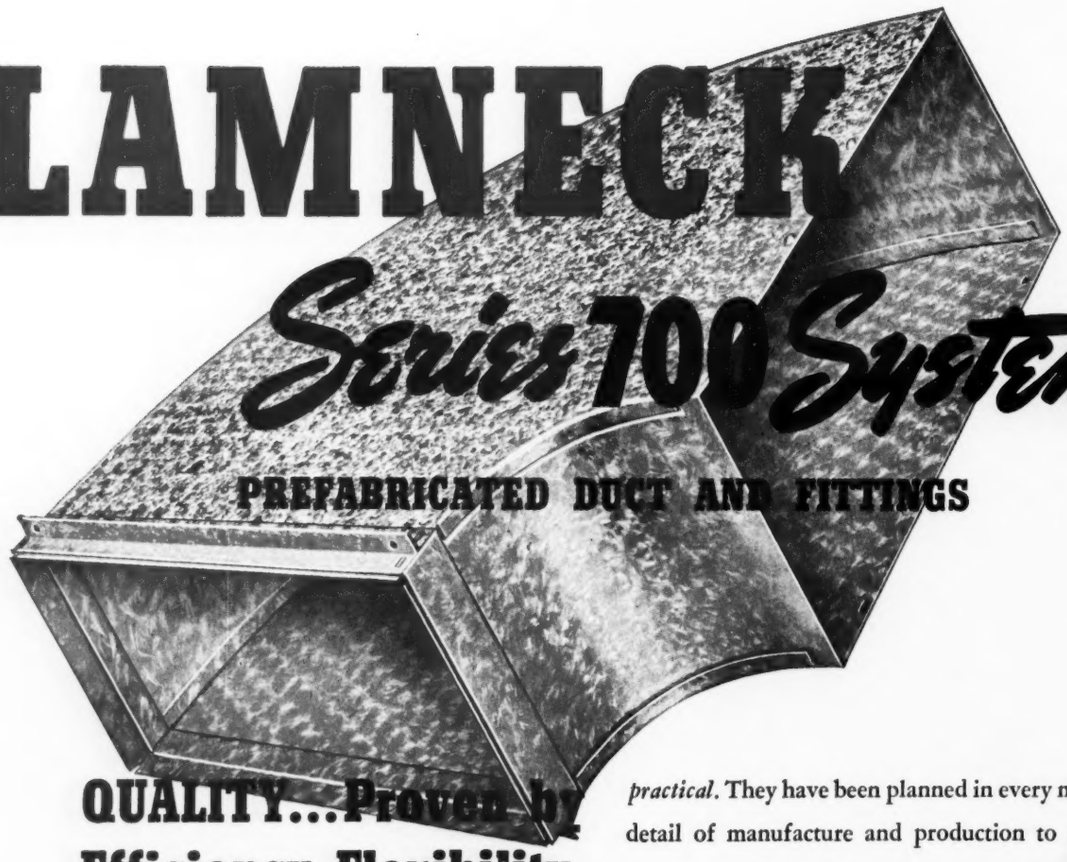
RESIDENTIAL AIR CONDITIONING
WARM AIR HEATING · SHEET METAL CONTRACTING

ESTABLISHED
1880

LAMNECK

Series 700 System

PREFABRICATED DUCT AND FITTINGS



QUALITY...Proven by Efficiency, Flexibility, Economy, Appearance

● Lamneck Series 700 System of Prefabricated Duct and Fittings is a striking example of superior quality in functional design.

Each factor which enters into each individual unit, and into the completely installed system, has been planned, engineered, and built for efficiency—for the delivery of greatest air volume with minimum blower capacity. Through ingenious design, these greater efficiencies have been made *practical*. They have been planned in every minute detail of manufacture and production to assure greatest economy of material—greatest savings in *your* installation cost.

Pioneer Leaders in Prefabricated Fittings

Lamneck engineering knowledge has given the Series 700 System unmatched flexibility. From its minimum of items, an unlimited range of installations can be produced.

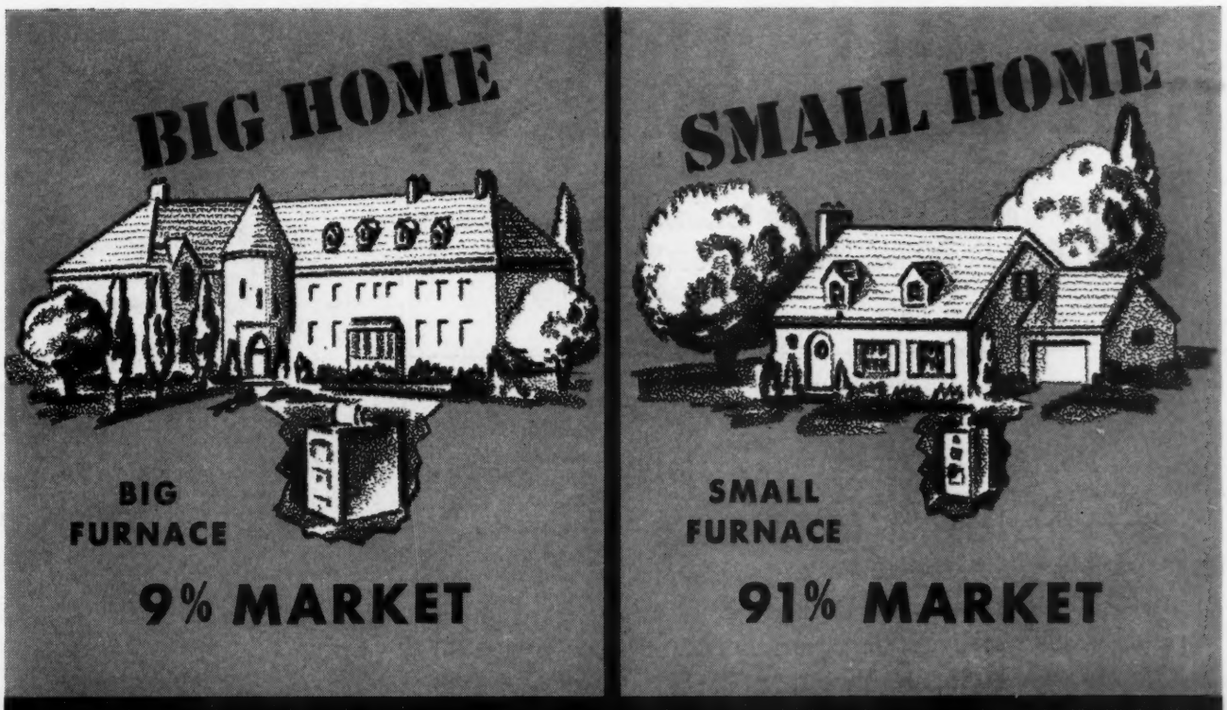
The Series 700 System shows to splendid advantage and helps promote increased prestige and business . . . each installation will be one to which you can point with pride. Write for complete information and name of your nearest LAMNECK Distributor.

LP INC

Specify LAMNECK

Simplified Furnace Pipe and Fittings, and Prefabricated Duct and Fittings for all Types of Residential Warm Air Heating and Air Conditioning Systems

LAMNECK PRODUCTS, INC., MIDDLETOWN, OHIO



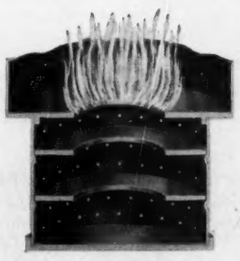
If You're Selling the 9%—DON'T READ THIS AD
If You're Selling the 91%—Sell LOCHINVAR!

THE big demand is for the Lochinvar-type of product. If you're the wide awake heating man in your territory, you'll be the one who cashes in on that demand by handling Lochinvar.

Lochinvar hits the mass market because it is priced right to give automatic heat at savings comparable to old-fashioned coal furnaces.

Lochinvar offers these advantages: (1) a complete line of quality oil burners that sell in the low-price field only because of the most modern large quantity production assembly line methods, (2) exclusive patented features that make for extra dependability and economy of operation, (3) all models listed as standard by Underwriters Laboratories.

You have the assurance of: (1) market survey figures to show amazing performance records, (2) large numbers in use, (3) plenty of housewife testimonials, (4) specific instances of volume sales to big real estate developments, and (5) tested literature that really builds sales for you. . . . Send the Coupon; get the facts!



There's No Other Burner Like Lochinvar's!

● Its features are exclusive, patented. Position of air holes both above and below the permanently fixed baffle (position patented) makes oil burn in suspension. Thus without any moving parts, Lochinvar gives the clean, soot-free flame of a pressure oil burner—with simple construction and at much lower cost. Stainless steel construction preserves exact diameter holes, keeps flow of air constant.

Burner and furnace are made for each other, both built in the same plant.

Lochinvar
AUTOMATIC OIL HEAT
AT LOWEST COST

• COUPON •

LOCHINVAR PRODUCTS
(Division of Michigan Tank & Furnace Corp.)
14247 Tireman Avenue, Dearborn, Michigan

Send me a full description of the Lochinvar line. Tell me about your program to build profitable small-home sales in my territory.

Company name .....

By .....

Address .....

City .....

☐ Check if you also want information on Lochinvar Oil Burning Water Heaters: low in cost, operation as little as ⅛ the cost of other fuels.

AMERICAN ARTISAN

WITH WHICH ARE MERGED

FURNACES AND SHEET METALS

AND

Warm-Air Heating

Covering All Activities in Residential Air Conditioning and Small Commercial Cooling, Warm Air Heating, Sheet Metal Contracting and Fabricating

J. D. Wilder, Editor — A. A. Kennedy, Assistant Editor

Vol. 109, No. 11 — November, 1940 — Founded 1880

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In This Issue

THE photograph on this month's cover shows an installation of stainless steel equipment in the Officers Club, Fort Sam Houston, Texas, fabricated and installed by Dean Specialty Works, San Antonio. The Sheet Metal Section cover is another Dean installation—Manhattan Cafe, San Antonio—also stainless steel.

•

The defense program is such a gigantic undertaking, involving such tremendous amounts of equipment that the total staggers the imagination. This month's Arnold Kruckman letter is a good example. He lists the projects as itemized November 1. We hope that every reader will study this list—not that work may be obtained, but in order that everybody in the industry will appreciate the tremendous scope of what lies ahead of us in heating and sheet metal.

•

We begin on page 33 a series of technical articles by Henry Aronson. Mr. Aronson—as a field engineer—has to lay out heating jobs day in and day out and has to save as much time as possible. To save time he has taken the Technical Code and prepared charts and tables from which all necessary answers can be read without any calculations and in a fraction of the time required to calculate each answer. We have called Mr. Aronson's method a Precalculated Code. We believe his method is a definite contribution to the engineering data of the industry.

•

We would also like to call attention to the job descriptions on pages 36 and 40. The first is an unusual school heating and ventilation method which ought to be interesting to every architect and school board member. The second describes an apartment job zoned for satisfaction of each tenant with dampers in the furnace bonnet—an unusual location.

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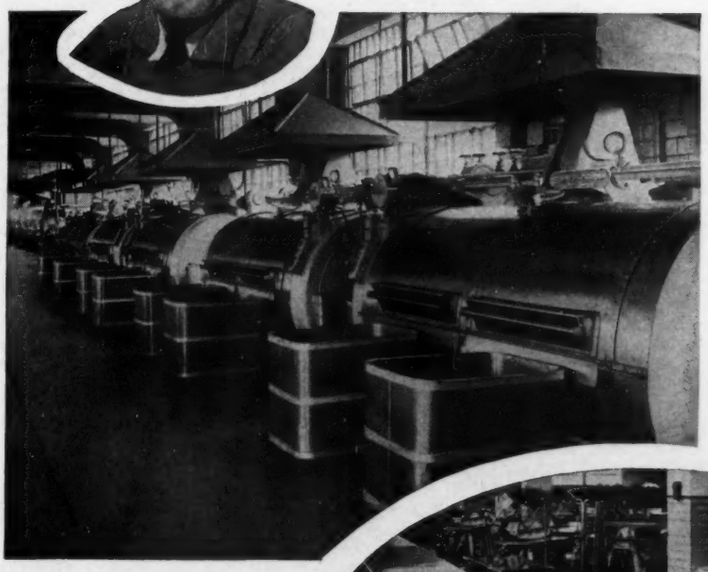
More than 8,000 copies of this issue are being distributed

Look before you Creep!

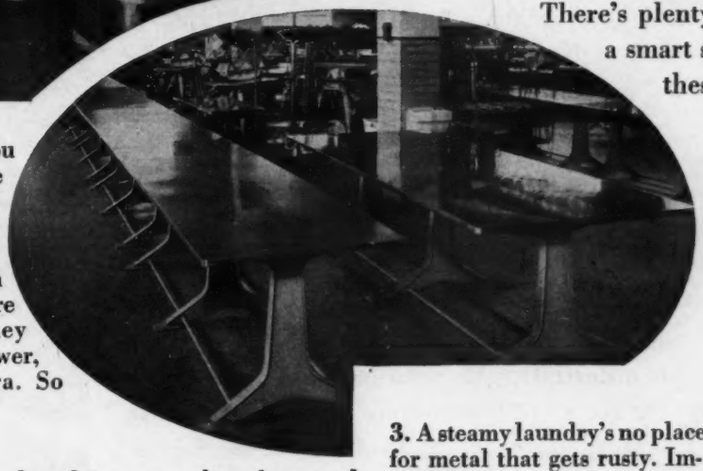
By TIM SHEARS



ON ACCOUNT of what happened when I was new in the sheet metal business I've always had a healthy respect for laundries. We're working on a job in one of 'em an' I'm holding a dolly while another guy does the rivetting. First chance I get I sneak off for a smoke.

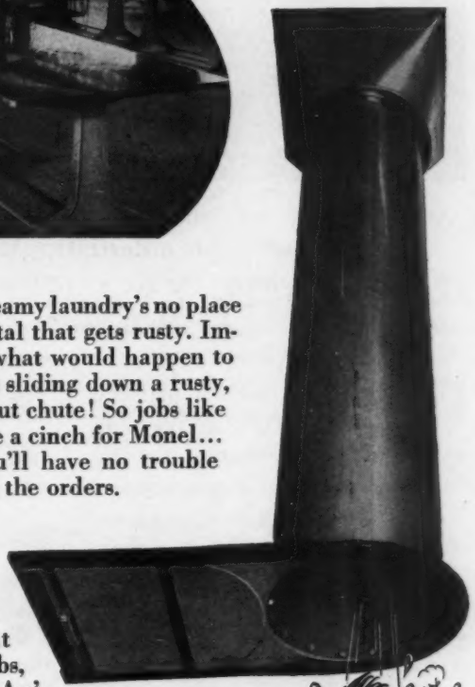
Just as I'm taking my second puff I hear the foreman coming. So quick, but quiet, I creeps into a little closet. Whoosh! Before I know it I've slid down a chute clean into a washer!

However, there's another reason why I've a healthy respect for laundries: There's plenty of jobs in 'em for a smart sheet metal man, as these pictures show:

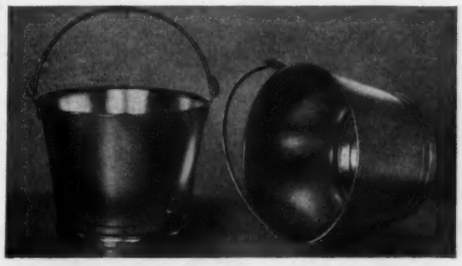


1. This first one'll tip you off on how to make the money. Most laundries use washers like these...made of Monel. They find that Monel washers keep clean and smooth inside, so are easy on clothes. Also, they save a pile of dough on power, water, soap an' etcetera. So here's what *you* do:

2. When you call on the laundries remember they need trucks like you see in the first picture, an' also table tops like these. All right, what are you going to make 'em out of? Same as the washers, of course . . . Monel. After all, a laundry owner don't spend thousands of dollars on Monel washers, *then take chances with trucks that get rusty an' tables that splinter!*



3. A steamy laundry's no place for metal that gets rusty. Imagine what would happen to clothes sliding down a rusty, worn-out chute! So jobs like this are a cinch for Monel... an' you'll have no trouble getting the orders.



4. Turning out Monel buckets is a paying proposition for two reasons: First, because they're simple to make. Second, because the laundries like these Monel buckets. They're easy to keep clean, can't rust, won't leak, and are good for a lifetime of hard service.

If there's anything you want to know about making any of these jobs, just drop me a line. An' keep your eyes open for this kind of business. The laundries are full of it . . . an' laundry owners want Monel.

TIM SHEARS

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street New York, N. Y.

"Monel" is a registered trade-mark of The International Nickel Company, Inc., which is applied to a nickel alloy containing approximately two-thirds nickel and one-third copper.

P. S. When you call on the laundries, look out for strange doors . . . they might lead to chutes!

"WE'LL GET THEM ALL RIGHT... *I'm calling Scully"*

Received telephone order 1:00 P.M. Saturday (warehouse closing time 12:00 noon) for six 8" 18.4 lb. beams for emergency use. Made delivery 2:30 same afternoon. (St. Paul Warehouse Report)

IT'S worth a lot to know that you can rely upon Scully always to fill orders in a hurry—whether they are regular orders or for emergency use.

Small orders, big orders, regular orders, rush orders—we treat them all alike. Every one of our eight warehouses operates on the same principle—that our customers want to feel that when they need steel, steel products, copper and brass, all they have to do is, "call Scully and relax."

Many years of careful attention to customers' needs has built up an enviable reputation for Scully Service. Huge stocks are on hand at 8 conveniently located warehouses—ready for quick delivery. Why not try us next time? Phone, write or wire the warehouse nearest you. And ask for a free copy of the Scully Stock List and Reference Book.

We are prepared...
Now, when quick delivery is more important than ever, it pays to call Scully. Huge stocks on hand—including *Cold Finished Bars, Bar Steel, Stainless Bars, Hot and Cold Rolled Alloys.*

Scully Service

USS

SCULLY STEEL PRODUCTS COMPANY

Distributors of Steel, Steel Products, Copper and Brass

Warehouses at CHICAGO · NEWARK, N. J. · ST. LOUIS · BOSTON
ST. PAUL-MINNEAPOLIS · CLEVELAND · PITTSBURGH · BALTIMORE

UNITED STATES STEEL

IF you're in business

for the same reason we are

...to make money...

TURN TO GE

James A. Hood, President of Hood-Myers Electric Co., successful G-E Dealers in Charleston, S. C., tells you how they know G-E offers the perfect dealer set-up . . .

❶ *for PROFITS*
—every month in the year!

"We wanted a business we could be proud of, work hard at and make money with.

"It's profitable because we've got the goods folks want and are willing to pay for. Practically every home owner and business man in our territory is a likely prospect. For either heating, cooling or refrigeration. Maybe all three!

"Right there's the big answer. We don't sit around waiting for the calendar. We're out after business every day—and getting it!

❷ *for PRODUCTS*
—with a famous name that sells 'em!

"Folks can be sold quality merchandise if you can prove what it will do for them. And when the name on it is *General Electric*. Say, half the selling battle is over before we can get into high gear. G-E spent plenty of dollars on research to build things right. That's what makes it easier for us dealers to sell 'em. It's the most convincing story any dealer can tell.

"G-E's complete lines just about cover all businesses and all incomes, big and little. If people want oil heat we've got it. Gas, we've got it. Warm air or radiator. Winter and summer air conditioning. Cooling for one room or a house. For stores, factories, restaurants or whatever. To keep 'em warm, to keep 'em cool or help 'em do more business. The finest that money can buy.

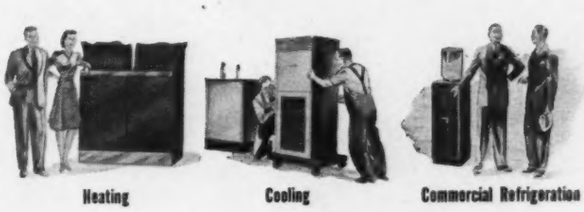
❸ *for PROMOTION*
—that backs you to the limit!

"G-E training has taught us and our men all the ground work. Our installations stick! And service is never a headache, either.

"Our G-E distributor is handy and the company district manager stops by regularly. Between the two of them we're well looked after.

"We cash in on the cooperative newspaper advertising G-E furnishes. On the national and trade advertising. We get direct mail campaigns and lots of literature. In fact, everything we need. To keep us and our men doing a healthy business.

"Now, we may seem prejudiced. But who wouldn't be if they're making money?"



Heating Cooling Commercial Refrigeration

GENERAL ELECTRIC

"Believe me, a G-E Dealership for your territory is worth finding out about. Don't wait. You can be a G-E Dealer if you can fill certain requirements. Send off the coupon today."

GENERAL ELECTRIC COMPANY
Division 199-1153, Bloomfield, N. J.
I want all details on the G-E Dealership for my territory.

*Name*_____

*Street*_____

*City*_____ *State*_____

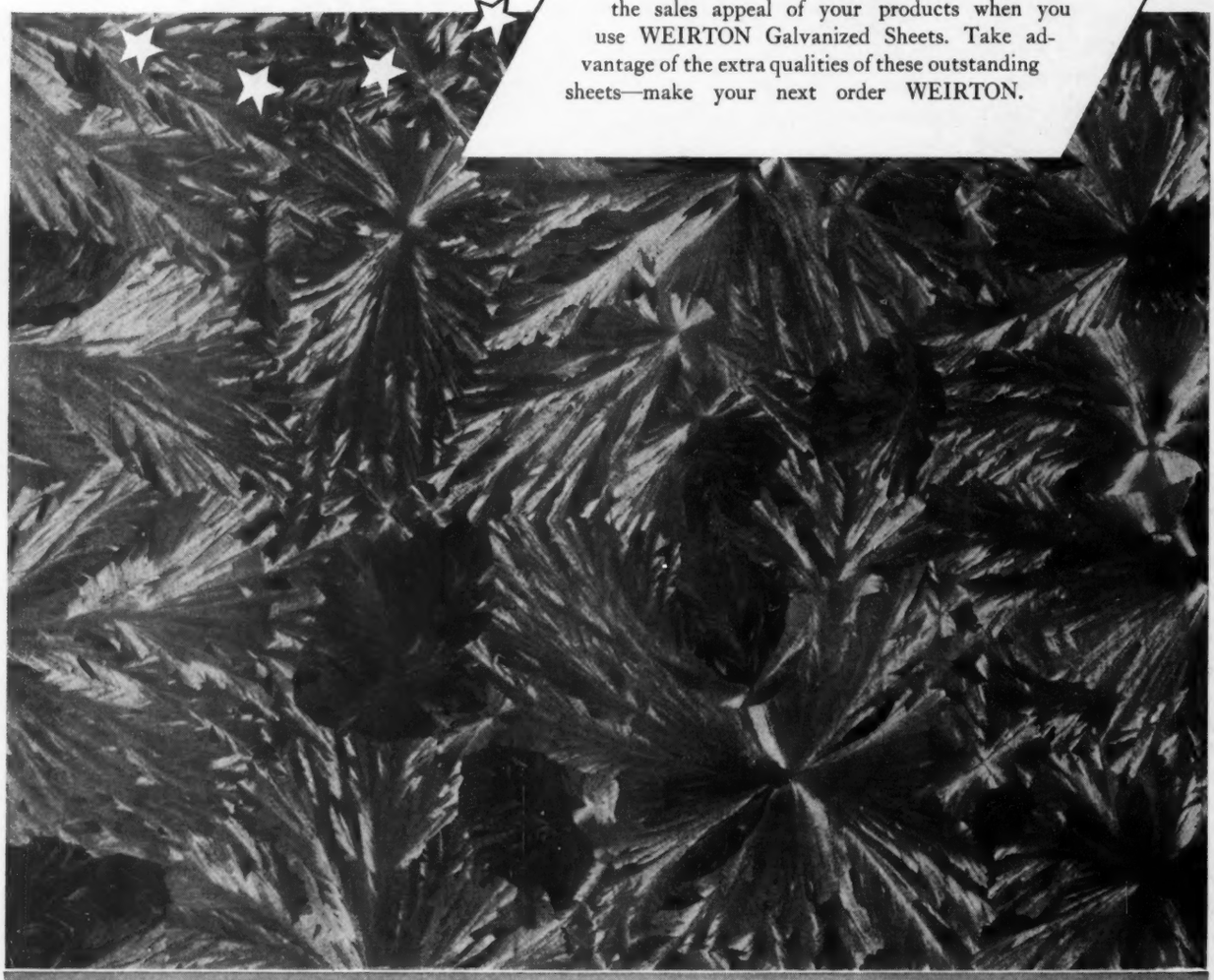
You get added

Sales appeal with

WEIRTON

Galvanized Sheets

Because Weirton Galvanized Sheets have the *finish* to give your product the maximum in appearance and the *adherence of coating* to withstand your forming and drawing operations you will heighten the sales appeal of your products when you use WEIRTON Galvanized Sheets. Take advantage of the extra qualities of these outstanding sheets—make your next order WEIRTON.



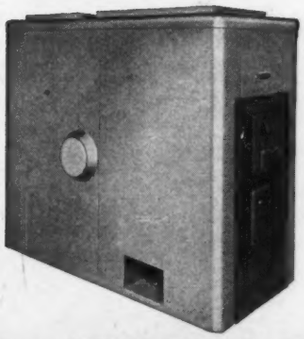
WEIRTON STEEL COMPANY—WEIRTON, W. VA.

Boston, 1324 Statler Office Building; *Chattanooga*, Hamilton Bank Building; *Chicago*, 2128 Builders Building; *Cincinnati*, 2606-7 Carew Tower; *Cleveland*, 1217 Leader Building; *Denver*, John S. Worthington Co., 511-513 Mercantile Building; *Detroit*, General Motors Building; *Houston*, 1901 Franklin Avenue; *Indianapolis*, Chamber of Commerce Building; *Kansas City, Missouri*, 231 West Forty-Seventh Street; *New York*, 405 Lexington Avenue; *Philadelphia*, Broad Street Station Building; *Rochester*, Genesee Valley Trust Building; *San Francisco*, 824 Sharon Building; *St. Louis*, E. R. Hensel Company, Cotton Belt Building; *Montreal, Quebec*, A. C. Leslie & Co., Ltd., P. O. Box 1420; *Toronto, Ontario*, A. MacNish, 357 Bay Street.

division of NATIONAL STEEL CORPORATION

Executive Offices, Pittsburgh, Pa.

Turn to

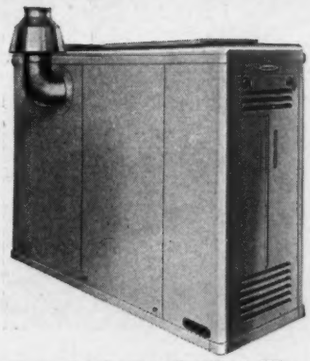


Moncrief Stoker Fired Winter Air Conditioner

Moncrief Aristocrat Coal-Fired Winter Air Conditioner

MONCRIEF

and See Sales Step UP



Moncrief Aristocrat Gas-Fired Winter Air Conditioner

COMPLETE LINE
Gives You Every Advantage

Home owners are constantly becoming more and more "choosey." So, if you want to care for all to their complete satisfaction, you need a line of furnaces and winter air conditioners of all types, sizes and prices, such as Moncrief affords. No matter what anybody wants, whether the call be for quality, style or good straight value, you can supply it best in a Moncrief unit. Turn to Moncrief and put yourself in position to compete to advantage for any job that comes up in your community.

"DST" Stoker Fired Steel Furnace

MONCRIEF PIPE AND FITTINGS

For both gravity and air conditioning installations. Moncrief Patented Lock Joints on wall stacks, stack heads, foot pieces and trunk duct fittings make a neater, more efficient job, easier to install. Send for our big Pipe and Fittings Book.

Series "C" Cast Furnace

MONCRIEF ENGINEERING SERVICE

Moncrief Dealers need not hesitate to call on Moncrief Engineers to help them estimate and lay out plans.

Send for particulars of the business—getting profit-making Moncrief Proposition.

The Henry Furnace & Foundry Co.

3473 E. 49th St., Cleveland, Ohio

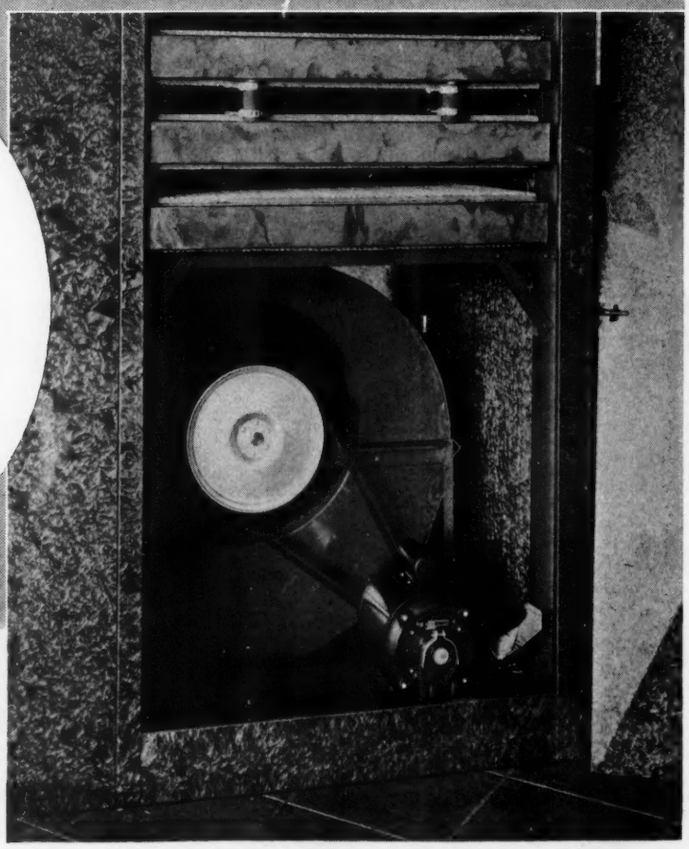
Moncrief Supplies Everything Used on a Warm Air Heating and Air Conditioning Job

GET THE CENTURY "SPECIFIC PERFORMANCE" MOTOR THAT FITS YOUR JOB

Century

MOTORS

Assure



Century ½ horsepower capacitor start motor driving a furnace blower.

Smooth, Quiet Operation for Your Fans and Blowers

Century Capacitor Motors, engineered for this particular job of operating fans and blowers, offer you the following advantages:

1. Quiet Starting — no motor noise to be heard "upstairs"
2. Quiet Acceleration — quietly but quickly bring the load up to full speed
3. Quiet Operation — no motor hum to be carried to points of air discharge
4. Cushion Base — isolates vibration from the installation

All of these motor characteristics are essential if you are to secure the maximum of user satisfaction.

Whatever your motor requirements in the heating, cooling or ventilating field, there is the proper Century Motor to assure you the most economical and satisfactory performance. This is made possible by the wide selection of Century Motors available for practically any application — in types and sizes ranging from fractional up to 600 horsepower.

It will pay you to investigate how the selection and proper application of the *right* Century Motor will contribute to the improved performance of your product or your installations. Your nearest Century Motor Specialist is fully equipped to serve you. To save time and money — call him in.

CENTURY ELECTRIC COMPANY

1806 Pine St. St. Louis, Missouri

Offices and Stock Points in Principal Cities

Century MOTORS

One of the Largest Exclusive Motor Manufacturers in the World

TRIPLE THREAT

Randall

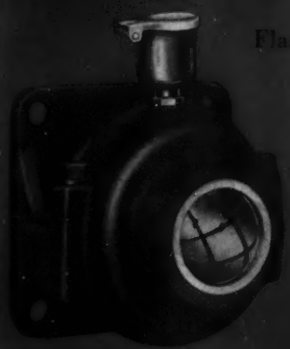
in air-conditioning

One Piece Steel Housing Pillow Block

This low-cost bearing is the most popular in the industry and the highest in production in the Randall line. Available for shafts up to 1 5/16". Mounts in any position.

Universal Pillow Block

Designed to meet the most exacting demands of engineers, the Universal operates satisfactorily in any position under severest conditions.



Flange Pillow Block

The rugged construction of the Flange provides ample safety factor for the most severe side mount bearing applications.

The "triple threat" man is thrilling in action on the football field, but no more useful nor more important to his team than Randall bearings to air conditioning equipment.

Reliability . . . quiet operation . . . long life, all are essential to efficient bearing performance in this field.

Over a million Randall Pillow Blocks operate dependably on virtually every type of equipment. In your installations they are assurance that your air conditioning blowers will be free from metallic bearing noise. Randalls give many extra years of trouble-free service with only minimum attention. They are self-lubricating and self-aligning.

Quiet

Randall, with over a third of a century's experience, is a veteran in the design and construction of efficient and economical bearings. Consult Randall engineers freely . . . they will gladly cooperate in solving your bearing problems.

Write for new 1941 catalog showing the complete Randall line.

Representatives Carrying Stock

C. W. Marwedel
San Francisco, Cal.

Salt Lake Hardware Co.
Salt Lake City, Utah

Tek Bearing Co.
177 Lafayette, New York City

RANDALL GRAPHITE PRODUCTS CORPORATION

Dept. 1111 609 W. Lake St. Chicago, Ill.

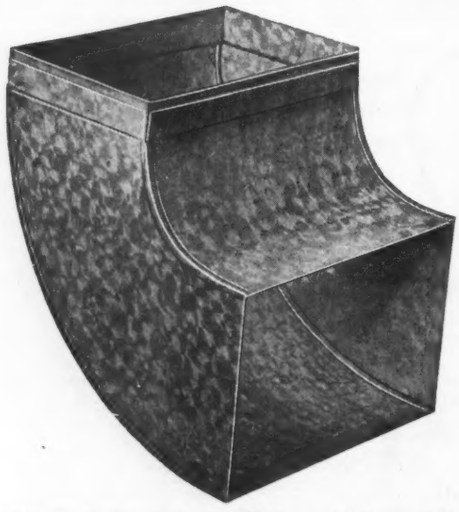
No New Automobile Or Radio Will Keep a Home Warm This Winter!

"New Model" time is here. People with money to spend are looking for the best VALUES for their dollars. So—

Are You Making Any Effort to Convince Prospects That a New Furnace Will Be on the Job Giving Homes Live-In-Able Temperatures Years After All the New Autos Have Gone Their Last Mile?

Right now—within a mile of YOU as you read this—are homes needing new heating equipment or the modernization of what they have *and the owners have the money to pay the price*—but if they buy Horse Power instead of Heat Radiation you lose money!

HANDY PIPE



"Built to Outlast the Buildings It Goes Into"

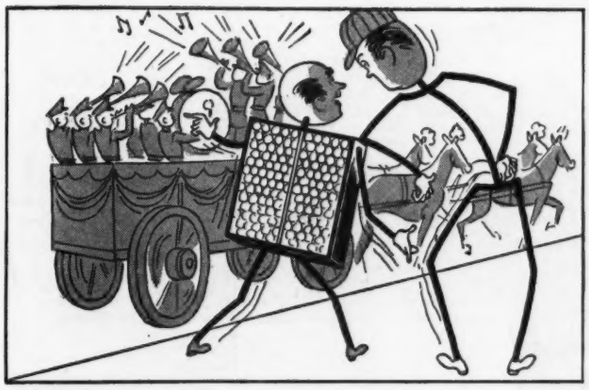
is the industry's leader in service to both installer and consumer.

Accurately designed for every job from the simplest to the most intricate, and prefabricated to keep labor costs at a minimum, HANDY PIPE helps every job perform to your credit.

If you haven't our Catalogue No. 52, ask for a copy.

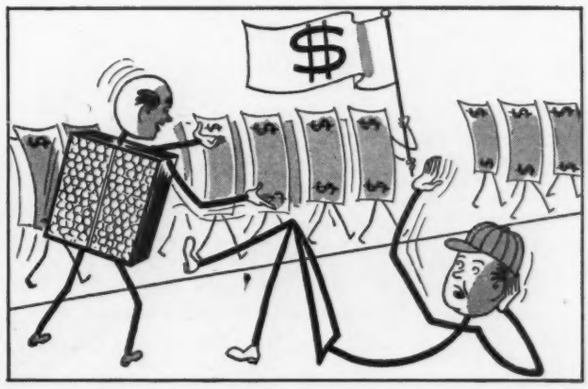
F. Meyer & Bro. Co.

Peoria
Illinois



Dust-Stop Man: Why don't you hop on the Dust-Stop* band wagon, Bill?

Heating Contractor: Where's it going?

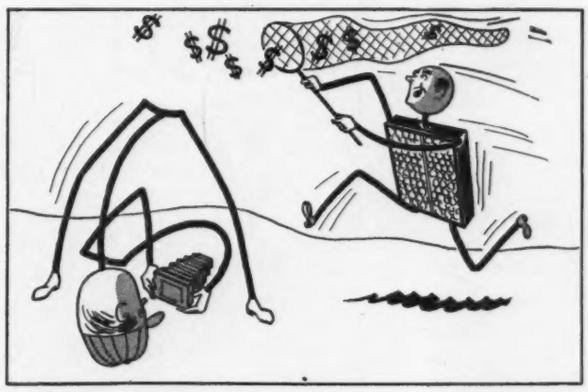


D. S. It's going after the easy profits in selling Dust-Stop filter replacements to householders.

H. C. Shucks! People don't even know they've *got* filters. So how can you make 'em buy replacements?

D. S. Don't be an ostrich, Bill. All you have to do is tell people they have filters and should change 'em—and they rush to buy.

H. C. Aw, I can't afford to hunt up all those householders just to sell them three or four filters.

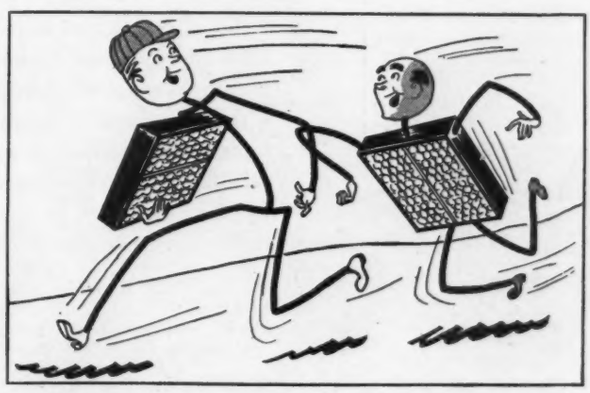


D. S. You can net plenty of profit dollars now. The makers of Dust-Stops will *give* you the biggest and best set of sales helps ever offered on filters.

H. C. Sounds like a snap to me. Go on! Go on!

D. S. It's easy as rolling off a log. Just ask your jobber for the big broadside that tells about the **FREE** mailing pieces, **FREE** postcard reminders, and **FREE** Blower Labels!

H. C. Boy, will I! I'll get in touch with my jobber right away.



D. S. Now you're talking, Bill. And don't forget that, besides nice profits on Dust-Stops, they give you a foot in the door so you can sell other profitable services and materials.

H. C. I'm climbing on the Dust-Stop band wagon right now!

FIBERGLAS* DUSTOP* AIR FILTERS

*T.M. Reg. U. S. Pat. Off.

Made by Owens-Corning Fiberglas Corporation, Toledo, Ohio

DIRECT CANADIAN INQUIRIES TO FIBERGLAS CANADA, LIMITED, OSHAWA, ONTARIO

When Installing Year 'Round Air Conditioning in a Small or Large Home, Remember-

THE RIGHT EQUIPMENT for *Every Job* is a LAU BLOWER

There's no home air conditioning job that's too large or too small to stump the dealer handling Lau equipment.

Over 22 sizes, in single speed and two speed, complete assemblies and package units, are made to meet large home requirements, and commercial installations.

And for the thousands of small homes to whom the sale of larger units is impossible, Lau offers the BLO-ETTE, in four sizes. It's shipped assembled . . . will go through any door.

New Installations and Forced Air Modernization Both Make Profitable Fall Business

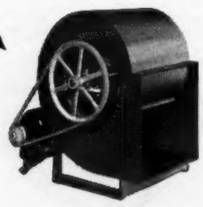
Don't stop with new home installations. There's a fertile field awaiting Lau dealers who are prepared to remedy the thousands of existing unsatisfactory gravity jobs with Lau Blower installations. Both the economy of forced air circulation and the advantages of summer ventilation appeal strongly to home owners whose gravity furnaces are in too good condition to consider replacing.

WARNING! Make sure the air conditioning unit you sell is equipped with a Lau Unit. Lau also makes wheels, casings, pillow blocks, and attic fans . . . all embodying the same skill in Lau engineering design and precision quality workmanship.

Write Lau for complete information, catalog, and prices.

BLO-ETTE for Small Homes and Modest Incomes

Shipped assembled to go through any door. Extremely quiet. Smartly streamlined casing adds to attractiveness of any basement. Easy access to filters and motor. Low cost for smaller homes.



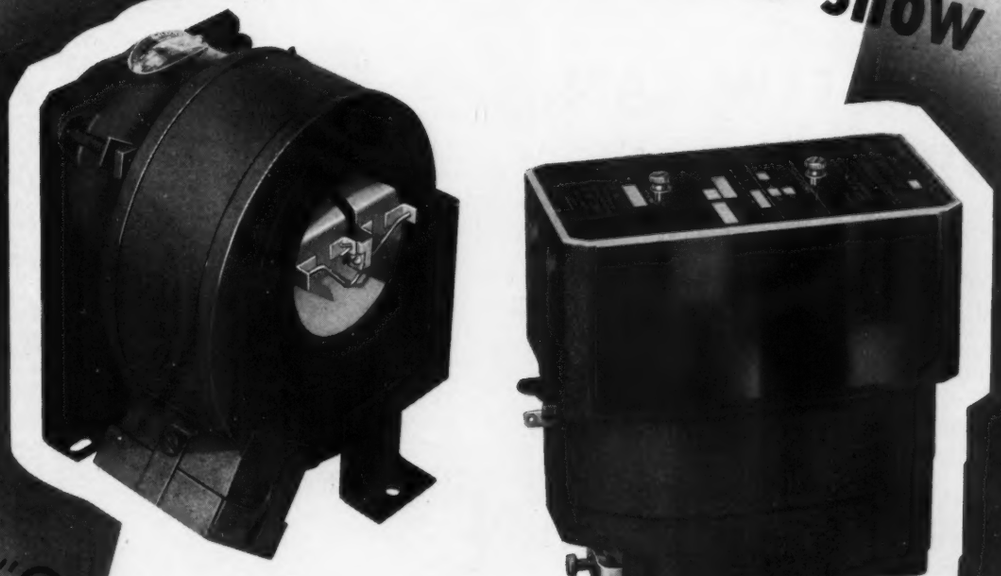
LAU COMPLETE ASSEMBLIES FOR LARGE HOMES AND COMMERCIAL INSTALLATIONS

Low speed, high delivery. Dynamically balanced wheels. Statically balanced pulley wheels. Self-aligning, self-oiling Lau Pillow Blocks. Automatic Belt Tightening device. Automatic Cut Out on motor. Rubber cushioned. Rated by A.S.H.V.E. standards. Top, side, and rear motor mountings. Over 22 sizes.

Write

THE LAU BLOWER CO.
2005 Home Avenue Dayton, Ohio

VAPORIZING FURNACE BURNERS get a new chance to show off



"GENUINE DETROIT" Controls have contributed greatly to the improved performance of vaporizing type oil burners. Because of this, there is an increasing demand for the low cost, oil burning furnaces.

Detroit Controls embody an entirely new method of fuel and combustion air control. They provide new efficiencies, accurate fuel and air control regardless of stack or draft conditions, a new low in "pilot" oil consumption and with complete dependability.

All this has been accomplished without sacrificing the simplicity of design for which Detroit Controls are famous. Setting of fuel delivery at installation is the only adjustment and frequently even this will be found unnecessary. No adjustments are needed to synchronize fuel and air deliveries—a unique feature of Detroit Controls that insures a clean, efficient flame without carbon deposits.

Detroit Fuel Oil Controls are made in a wide variety of types and combinations. They fit the requirements of the burner builder exactly and provide that burner with great, new possibilities.

It will pay you to investigate vaporizing oil burning furnaces and will pay you doubly to make sure that they are equipped with Detroit Controls.

DETROIT LUBRICATOR COMPANY

General Offices: DETROIT, MICHIGAN

Canadian Representatives — RAILWAY AND ENGINEERING SPECIALTIES LIMITED, Montreal, Toronto, Winnipeg

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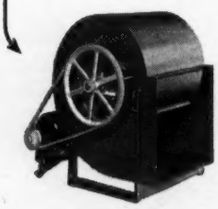

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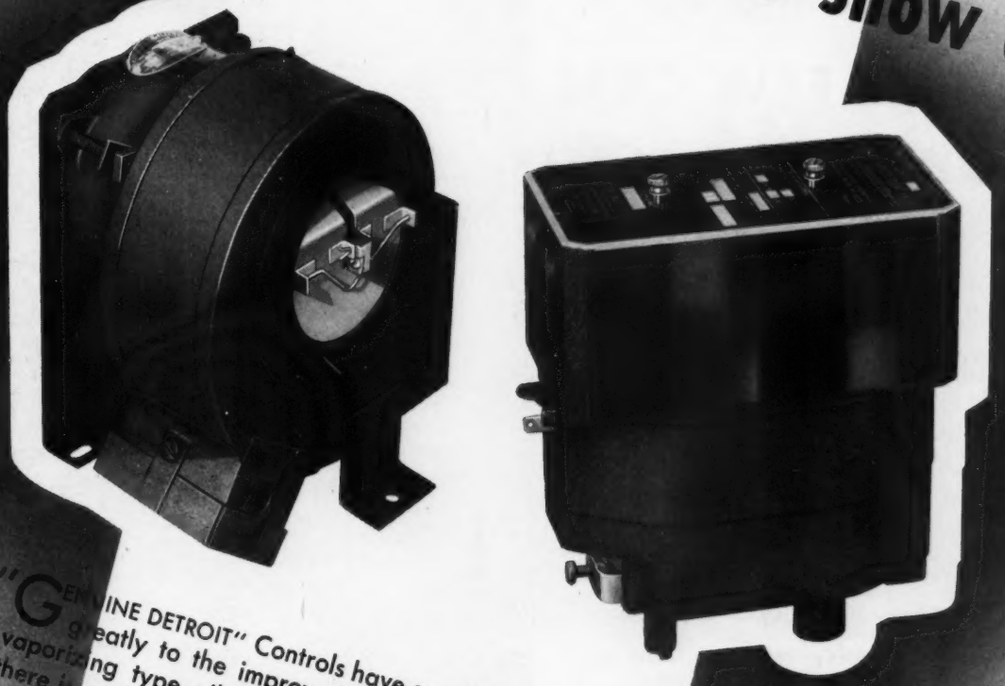
Write
THE LAU BLOWER CO.
2005 Home Avenue Dayton, Ohio
BLOWERS • FANS • WHEELS • PILLOW BLOCKS
LAU
THERE'S A SALES ENGINEER NEAR YOU

VAPORIZING FURNACE BURNERS get a new chance to show off



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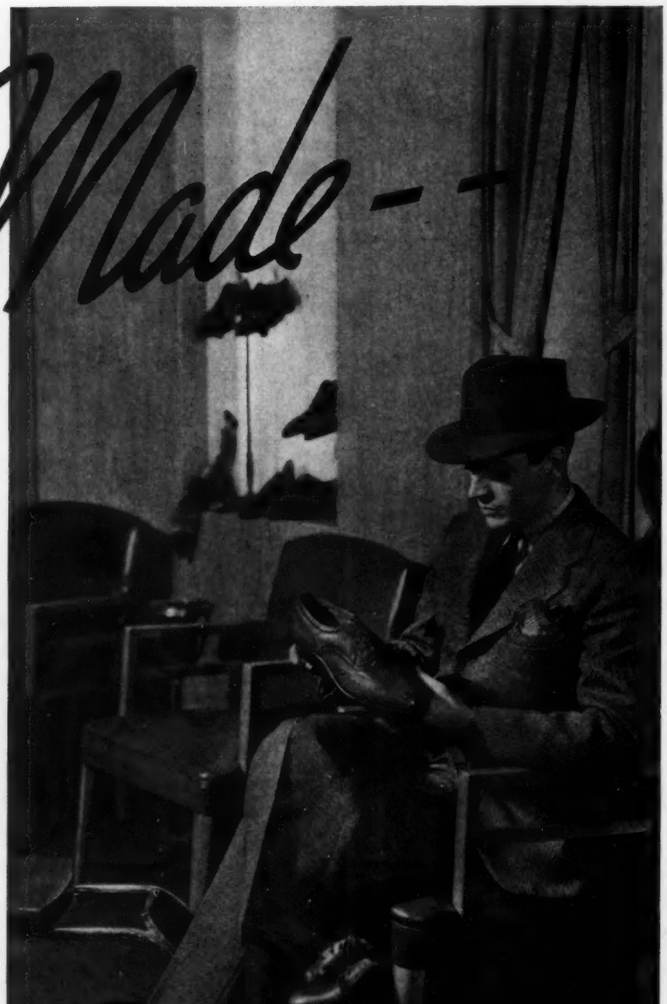
DETROIT LUBRICATOR COMPANY

General Offices: DETROIT, MICHIGAN

Canadian Representatives — RAILWAY AND ENGINEERING SPECIALTIES LIMITED, Montreal, Toronto, Winnipeg

Hand Made--!



YES, BUT FEW CAN AFFORD THE PRICE

Most of us recall the days when the automobile, radio and even the clothes we wore were made largely by hand. What happened to change all this? Certainly it was not that the hand-made article was of inferior quality. No, it was simply because all of us wanted to own these luxuries, but few could afford to buy them.

Today, we live in a machine age and the man who tries to get along with the obsolete tools of his trade, loses out. This applies wherever there is competition and who will say that little or none exists in the sheet metal industry?

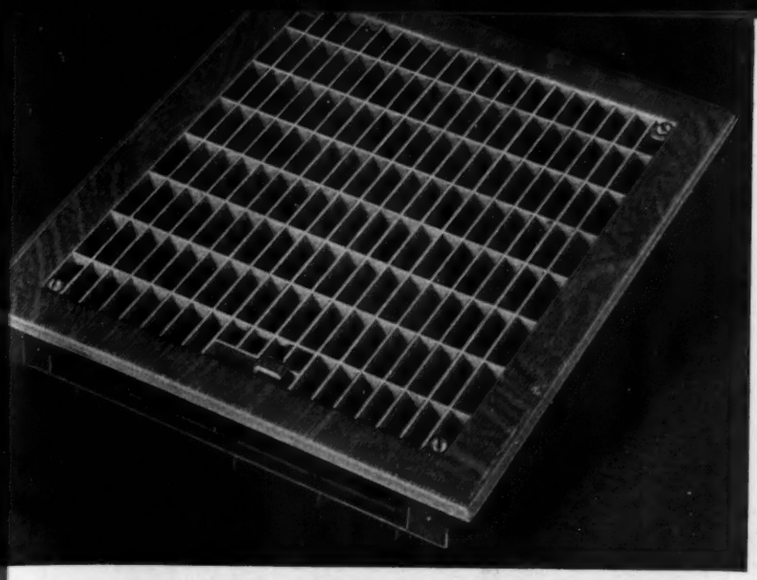
The demand for cost-cutting sheet metal working machinery is greater now than it has been for several years. This indicates that shop owners believe business is going to remain good and are putting themselves in position to get more of it. We think they are right and that, due to the unusual conditions, this is a good time to consider your own needs.

OSBORN MACHINERY AND TOOLS

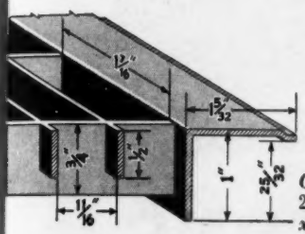
- ANGLE IRON SHEARS AND BENDERS
- BAR FOLDERS
- BENCH MACHINES
- BOLT CUTTERS
- BRAKES... HAND & POWER
- DRILLS & GRINDERS, ELECTRIC
- DRILL PRESSES
- ELECTRIC TOOLS
- FLANGING MACHINES
- FORMING ROLLS
- GROOVING MACHINES
- PITTSBURGH LOCK MACHINES
- POWER PRESSES
- PUNCHES... HAND & BENCH
- ROLL FEEDS
- ROTARY MACHINES
- RULES & TAPES
- SHEARS... HAND & BENCH
- SLITTING SHEARS
- SQUARING SHEARS
- UNISHEARS
- ALL TYPES OF METAL WORKING HAND AND BENCH TOOLS

THE J. M. & L. A.
OSBORN Co
CLEVELAND, OHIO
BUFFALO • CINCINNATI • DETROIT
Distributors of Metals and Metal Products

A DEPENDABLE SOURCE OF SUPPLY FOR 81 YEARS



No. 210 FLOOR REGISTER
Standard mesh 7/16" x 1-7/16"

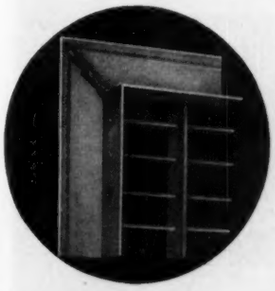


Cross section of No. 265 in 4"-18" widths x 4"-60" lengths. Larger sizes are made with deeper braces for greater rigidity.

H & C "NO-FLEX" Registers and Return Air Faces are exceptionally strong and rigid due to the fact that the cross members are welded to each other and to the frame at frequent intervals.

Cross members have squared edges for improved walking surface and better appearance. ALL ITEMS IN THIS SERIES HAVE UNUSUALLY LARGE AIR CAPACITY.

Top-notch workmanship with careful attention to each and every detail, and hi-baked, lustrous finishes of lasting attractiveness assure maximum satisfaction. Your customers will appreciate the superior quality of these deservedly popular items.



Illustrating the manner in which corner joints are welded on underside.

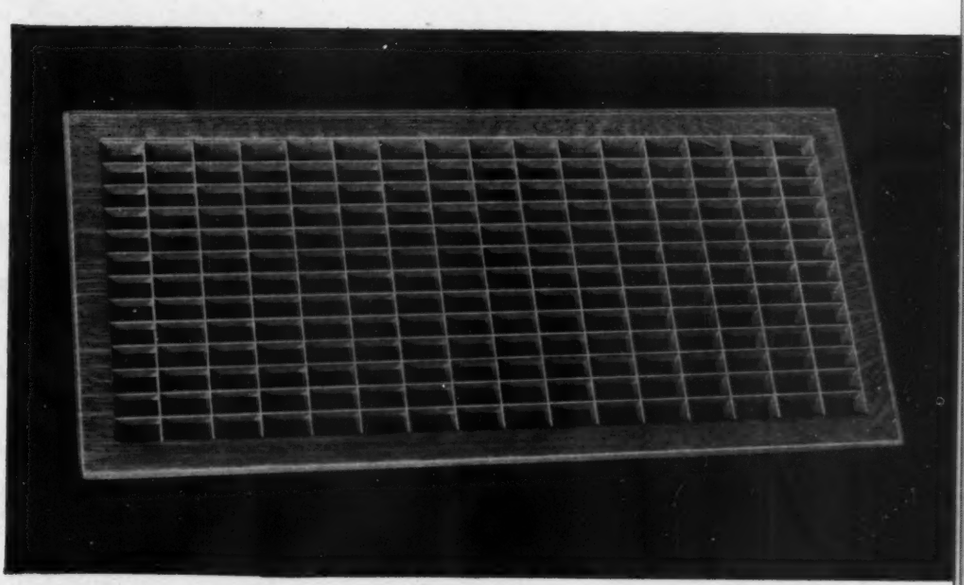
Current Catalogs—No. 40AC (Air Conditioning Registers)—No. 37 (Gravity Registers)—also, 7th Edition Pocket Guide. If not on hand, write us.

H&C

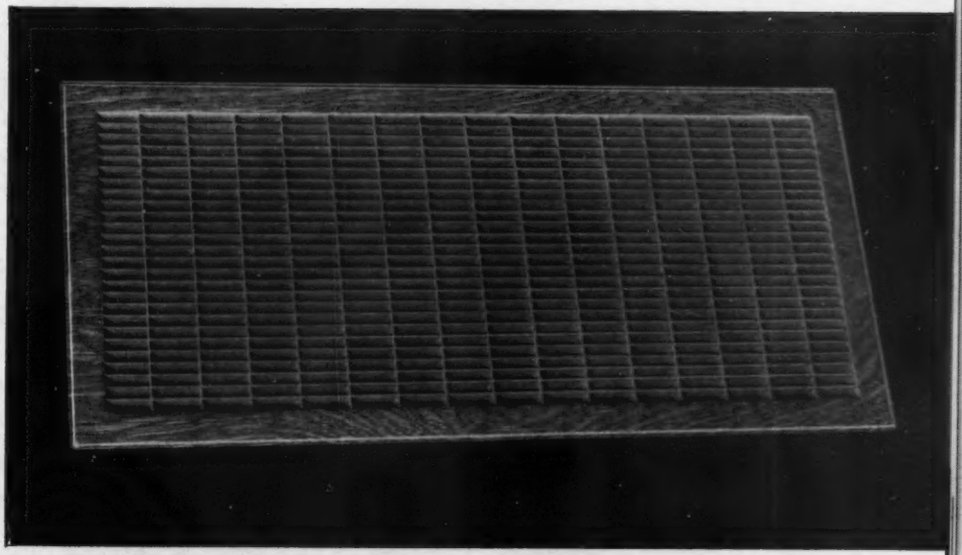
"NO-FLEX" REGISTERS and RETURN AIR FACES

are BETTER MADE . . . BETTER LOOKING MORE EFFICIENT and BOUND TO MAKE A BETTER IMPRESSION ON YOUR CUSTOMERS

It pays to use the BEST, particularly when, as in this case, it costs you NOTHING EXTRA. Try H & C "NO-FLEX" REGISTERS and RETURNS on your next job and you'll always use them.

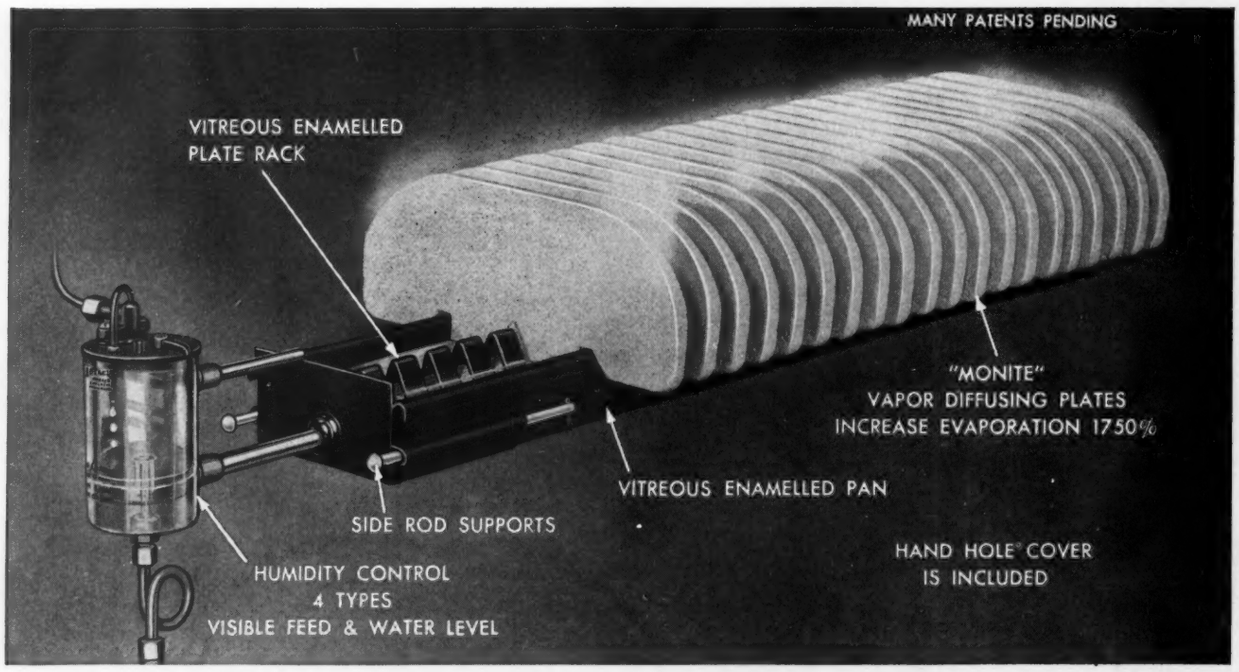


No. 265 RETURN AIR FACE
Standard mesh 11/16" x 1-7/16"



No. 266 RETURN AIR FACE
Standard mesh 5/16" x 1-7/16"

HART & COOLEY MANUFACTURING CO
Warm Air Registers • Air Conditioning Grilles • Damper Regulator Sets • Dampers • Chain • Pull
FACTORY AND ENGINEERING SALES OFFICE:
HOLLAND (H&C) MICHIGAN
Chicago Office: 61 W. Kinzie St. Philadelphia Office: 1600 Arch St.


MANY PATENTS PENDING
VITREOUS ENAMELLED PLATE RACK
"MONITE" VAPOR DIFFUSING PLATES INCREASE EVAPORATION 1750%
VITREOUS ENAMELLED PAN
SIDE ROD SUPPORTS
HAND HOLE COVER IS INCLUDED
HUMIDITY CONTROL 4 TYPES VISIBLE FEED & WATER LEVEL

EVAPORATING RATE 7½ TONS
OF WATER PER SEASON!

THIS is the capacity of the above vapor diffuser in a forced air furnace with full heat on. (Other Monmouth Diffusers range from 2¼ to 50 tons capacity.) This remarkable capacity is due to improvement in Monmouth vapor diffusing plates—*3 plates now do the work of 4!* Each Monite plate is now equivalent to 70 sq. ins. water surface. This means fewer plates and a shorter pan—lowering prices of Monmouth Diffusers from 8½ to 30%, according to size. *Now Monmouth gives you the greatest evaporating capacity per dollar ever offered!*

★ ★ ★

FREE: Monmouth Humidifier Capacity Indicator Puts Humidification on a Scientific Basis

Humidification is useless unless there is sufficient capacity to do a thorough job. To give customer satisfaction, you must *know* how much water surface, or the equivalent, the humidifier must have for any given installation. The handy, pocket-size Monmouth Indicator gives you the correct answer instantly. Makes you an expert. *Sent FREE to heating men.* Write for yours today; it's a powerful aid in selling adequate humidifiers at better profit.

MONMOUTH PRODUCTS CO.
1933 E. 61st St. Cleveland, Ohio

MONMOUTH
The Greatest Name in Humidification

a DeLuxe ELECTRIC JANITOR

WITH THE NEW Chronotherm AT 20% LOWER PRICE

SIXTY-THREE percent of forced warm air systems are hand fired coal jobs. Here is a chance to make extra profit on these installations. Recommend and install the new Y17 Deluxe Electric Janitor Package. It now includes the new Chronotherm and yet there is a price reduction of $10.50, or twenty percent under the previous Deluxe Electric Janitor Package. Cash in on the popularity of the new Chronotherm, which is being advertised nationally in such magazines as "The Saturday Evening Post," "Life," "American Home," "Better Homes and Gardens," "House Beautiful," and "House and Garden." It gives your customers the nearest possible thing to automatic heating at a very nominal price and it greatly increases your profit. Minneapolis-Honeywell Regulator Co., 2728 4th Ave. S., Minneapolis, Minn. Canadian Plant: Toronto. European Plant: London. Company owned branches in 49 cities.

MINNEAPOLIS-HONEYWELL

CONTROL *Systems*

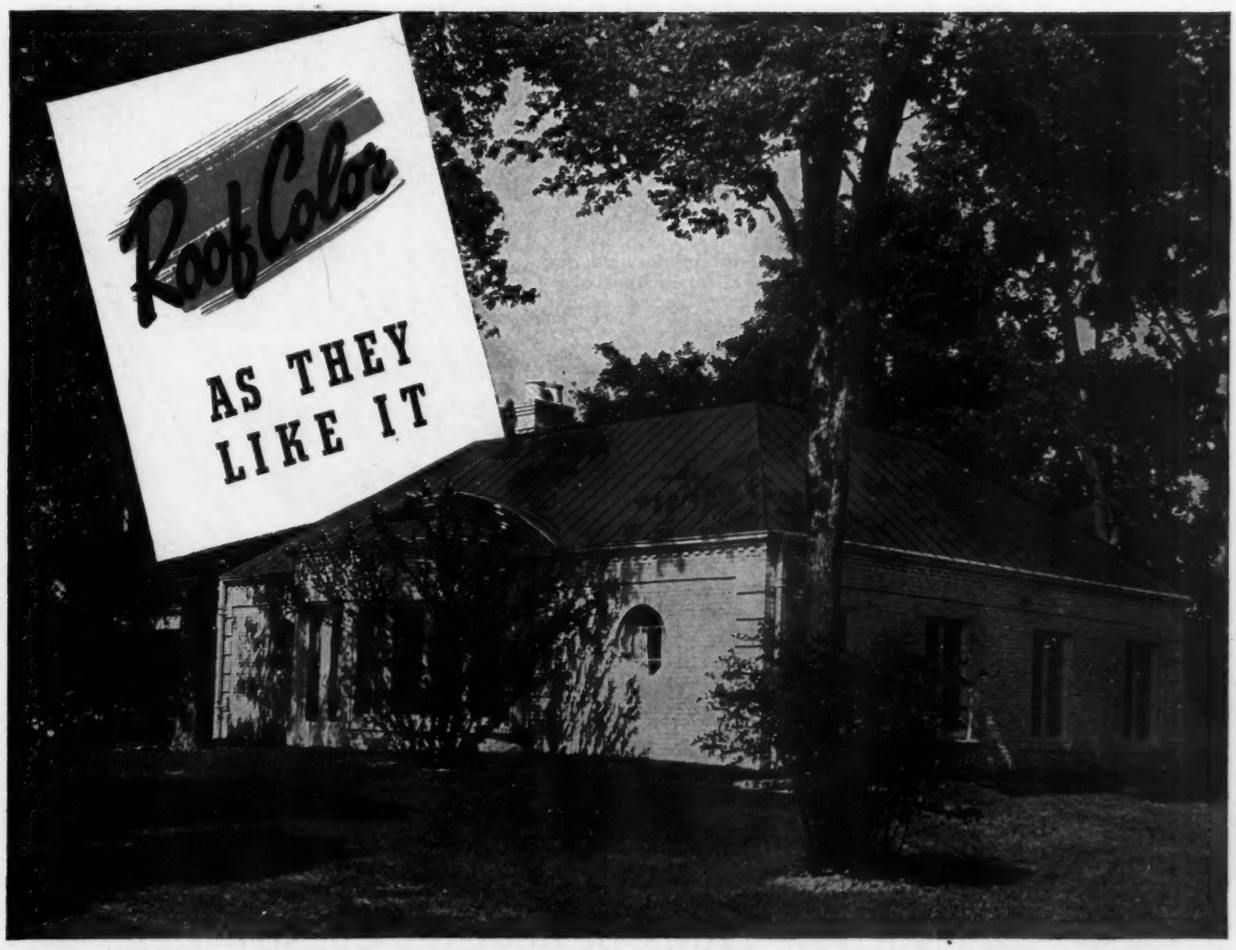
RYBOLT

• All air conditioning units look more or less alike to your customer. He knows little about the mechanical differences and cares less. What he really wants to buy is dependable, convenient and economical heating service to meet his special requirements.

He wants to enjoy the comfort and health provided by modern features which purify, humidify and automatically circulate the air at an even temperature throughout the house. RYBOLT Air Conditioning units are designed and built to meet these demands with complete assurance of unfailing performance. You can sell them with absolute confidence in their ability to deliver satisfaction. That is why every RYBOLT Air Conditioning unit you sell helps to sell another.

Write today for important information on the complete RYBOLT line.

THE RYBOLT HEATER COMPANY
615 MILLER STREET • ASHLAND, OHIO



Now with ARMCO PAINTGRIP SHEETS You Can Offer Customers a Metal Roof in Any Color They Desire

Many architects and builders are showing a marked preference for the attractive shadow lines of standing seam roofing. This is your cue to push the sale of metal roofing for all kinds of homes.

Here ARMCO Galvanized PAINTGRIP sheets give you definite advantages. The PAINTGRIP roofing you put up can be painted immediately in any color the owner wants. Rich greens or blues, or any harmonious color can be applied to PAINTGRIP quickly, easily and surely. The finely-textured surface of this special *bonderized* sheet is made to take paint and preserve it. Acid-etching or weathering is out. Tell your prospects about PAINTGRIP for all sheet metal work that must be painted. See the ARMCO distributor or write to The American Rolling Mill Co., 2821 Curtis St., Middletown, O.

Home of Carl F. Boester, St. Louis. Sheet Metal Contractor: John Steiner, St. Louis

Architects prefer it

When extra-long service and extra-low upkeep are desired, use galvanized ARMCO Ingot Iron with a PAINTGRIP finish. A study of medium and low-cost house issues of *The Architectural Forum* reveals that ARMCO Ingot Iron was specified more than any other trade-marked sheet metal. This is one way architects save money for clients.

ARMCO PAINTGRIP SHEETS

MADE OF ARMCO GALVANIZED PAINTGRIP

Great Leaders
"BUFFALO BILL"
Blazed New Trails . . .
Among the heroes of America's frontier "Buffalo Bill" stands foremost for his daring and romantic exploits. His service in opening undeveloped country contributed to the building of our Nation.

INDEPENDENT "Fabrikated"

Blazed New Trails in Register Construction

• Independent's invention of "Fabrikated" more than twenty-five years ago was then an adventure in register construction. "Fabrikated" attained popularity quickly because of the many advantages it presented, and it has now become the standard of register and grille construction. Even as there has been only one "Buffalo Bill," so there is today only one genuine and original "Fabrikated," and that is made by Independent, unexcelled for strength and rigidity, fine appearance and large open area.

SEND FOR CATALOGS

THE INDEPENDENT REGISTER CO.

3747 E. 93rd STREET • CLEVELAND, OHIO

640

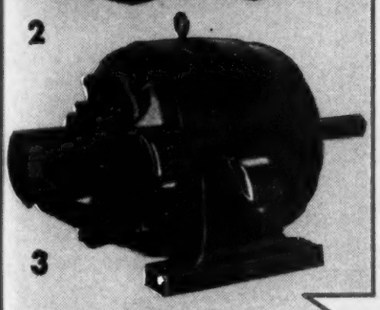
WAGNER MOTORS

are correctly engineered for every type of air-conditioning equipment—

No matter what type of air-conditioning equipment is involved . . . whether large or small . . . regardless of the torque, speed or current requirements, you can choose a motor from the Wagner line that is correctly engineered for the job. The 8 motors illustrated represent the types of Wagner motors most frequently used in air-conditioning work. Each motor has special electrical or mechanical characteristics that make it the ideal motor for certain applications.

1

2



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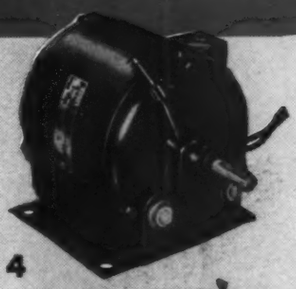

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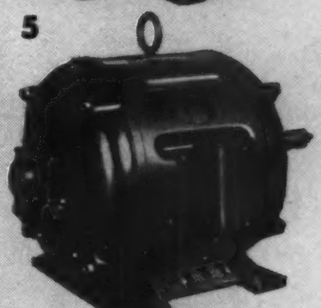

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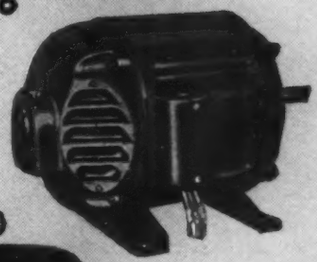

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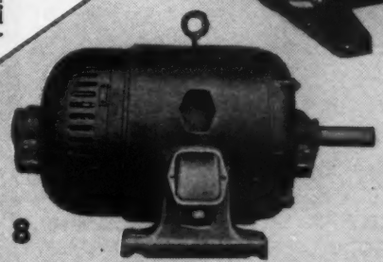


8

1. **TYPE RK, CAPACITOR-START INDUCTION-RUN** motors are suitable for driving refrigerators, household air conditioners, and other appliances. Drip-proof or totally-enclosed endplates; rigid or resilient mounted; 1/8 to 3/4 hp.

2. **TYPE RA, REPULSION-START-INDUCTION** motors are single-phase brush-lifting motors having high starting-torque and low starting-current. The ideal motor for heavy duty applications such as stokers, compressors, pumps, etc. Obtainable in various speeds, frequencies, and voltages; rigid or resilient mounted; 1/8 to 15 hp.

3. **TYPE RS, WOUND ROTOR (SLIP-RING)** motors have adjustable varying speeds and combine the ability to start extremely heavy loads with good running characteristics. Smooth starting and adjustable varying speeds are effected by the use of external resistors. 1 to 250 hp.

4. **TYPE M, SHADED POLE FAN** motors are single-phase induction motors of simple construction. Ideal for fan and blower drives in which the fans are mounted directly on the motor shaft. Totally-enclosed and open-type; rigid or resilient mounted; 1/250, 1/125, 1/80, 1/40 and 1/30 hp.

5. **TYPE TB, SPLIT-PHASE UNIT HEATER** motors are totally-enclosed to prevent entrance of dust or moisture; ball-thrust bearings on front end to take care of end-thrusts imposed by fans; rubber mounted for ultra-quiet operation. 1/20 to 1/4 hp.

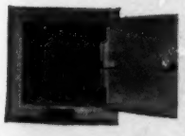
6. **TYPE RP, SQUIRREL-CAGE** motors are made in 7 electrical types varied as to torque and current characteristics to take care of a wide variety of applications. 2 and 3 phase; 1/6 to 400 hp.

7. **TYPE RD, DIRECT CURRENT** motors may be used for direct current service wherever repulsion-start-induction, split-phase, capacitor, or squirrel-cage motors would be used for alternating current service. Built in two types: Appliance type up to 1½ hp; Industrial type, 2 and 3 hp.

8. **TYPE RT, SPECIAL COMPRESSOR** motors were developed to meet the demand for a motor with high starting-torque and very low starting-current. The RT motor is ideal for large compressors. The very low starting-current permits across-the-line starting. 2 and 3 phase; 40 to 100 hp.

WAGNER COOLING AND VENTILATING EQUIPMENT

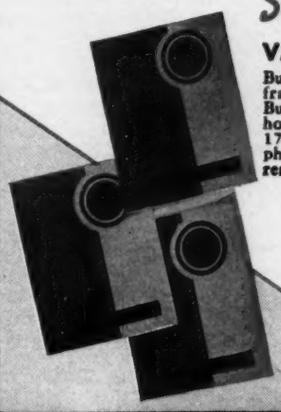
Wagner builds a complete line of cooling and ventilating equipment, including home cooler (attic) fan, apartment ventilators, wall box ventilators, window ventilators, ring-mounted ventilators, pressure type exhaust fans, air-circulators, ceiling fans, desk and pedestal fans, all described and illustrated in Bulletin FU-22, sent free upon request.



Wagner wall box ventilators are designed for permanent installation in the kitchen or bathroom wall—for removing cooking odors, smoke, grease-laden air or other undesirable air.

Wagner pressure type exhaust fans are designed to operate against ordinary pressure heads. Capacities 1,000 cfm to 6,700 cfm.

Wagner home cooler (attic) fans—for cooling homes, offices, industrial and commercial buildings. Capacities 7,000 cfm. to 20,000 cfm.



Send FOR THESE VALUABLE BULLETINS

Bulletin MU-177 covers Wagner fractional horsepower motors; Bulletin MU-182, Wagner integral horsepower motors; Bulletin MU-179, Wagner single-phase and direct-current motors.

Wagner Electric Corporation
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B40-35 AA

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Gentlemen: Please send me FREE bulletins
☐ MU-177, ☐ MU-179, ☐ MU-182, ☐ FU-22.

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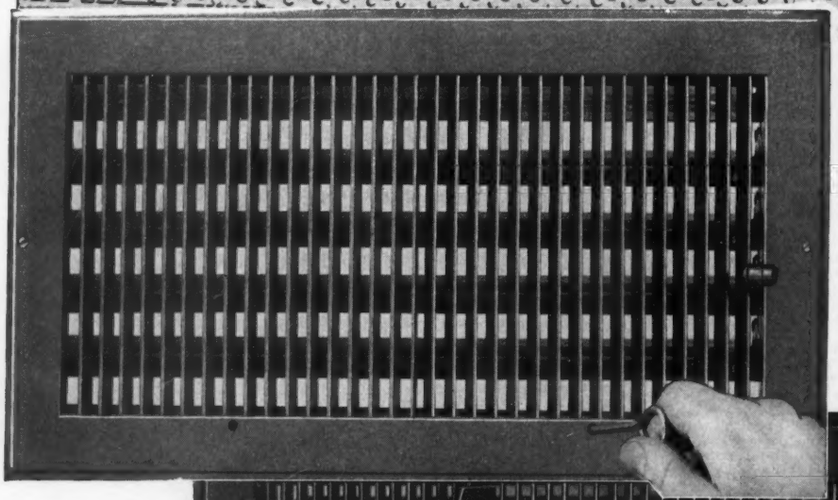
MOTORS • TRANSFORMERS • FANS • BRAKES

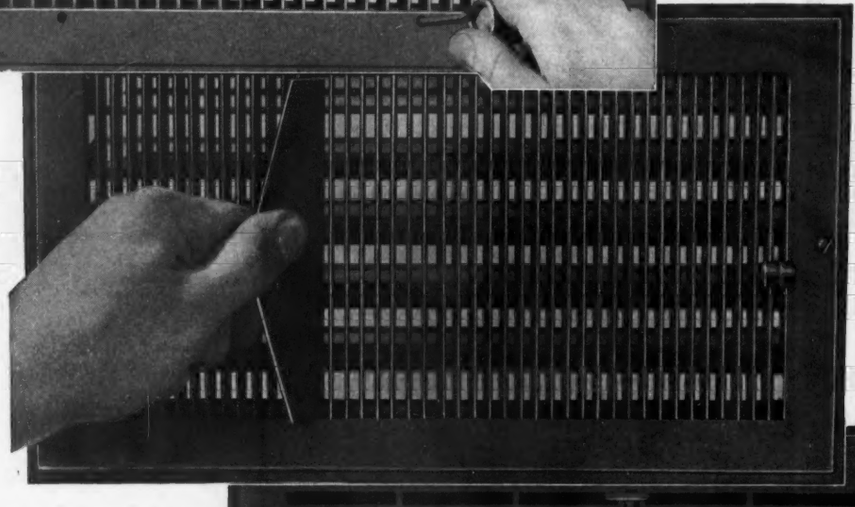
PREMIER SHOWING OF 1941 STANDARDIZATION OF THE FINEST U.S. AIR-CONDITIONING REGISTERS



FOUR-WAY FLOW ADJUSTABLE BAR

STYLE 249—Sidewall Type
STYLE 252—Baseboard Type—One-Piece
STYLE 251—Baseboard Type—Two-Piece
STYLE 176—7/8 Inch Baseboard Vent
STYLE 178—Flat Sidewall Vent

Key-Pin Operation Controls Side Flow. Lever Operation Controls Up and Down Flow. A FULL GRILLE LINE that has NO EQUAL.



Flex-Wrench sets Grille-Bars to Desired Angle of Deflection. Lever Controls Up and Down Flow.

FOUR-WAY Flow Flexible Bar

STYLES

256—Sidewall
267—Baseboard One-Piece
272—Baseboard—Two-Piece
176—7/8 Inch Baseboard Vent
178—Flat Sidewall Vent

COMPARE With OTHERS and ORDER U. S.

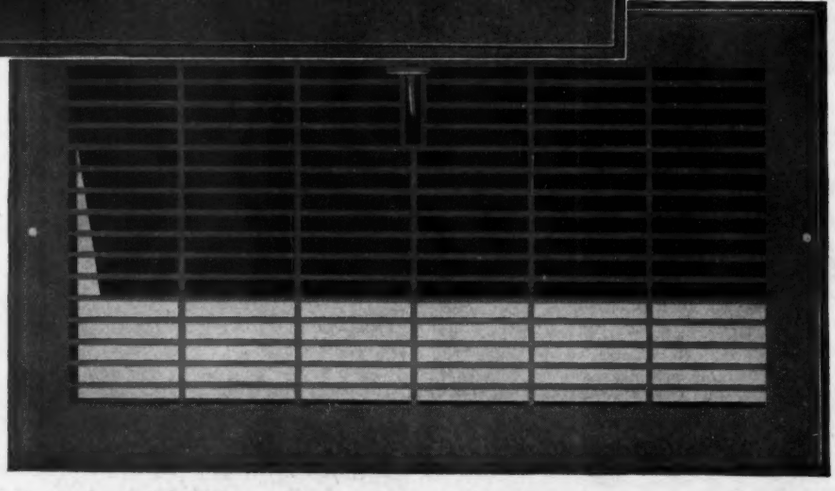
Positively the BEST in FLEX-BAR REGISTERS

NEW LOW COST LINE

Neat Slotted Design for 1941 Immediately Available.

STYLE 103-N—Sidewall Type
STYLE 109-N—Baseboard Type
STYLE 115-N—7/8 Inch Baseboard Vent
STYLE 118-N—Flat Sidewall Vent

EXCELS ALL LINES of LOW-COST NON-DIRECTIONAL FLOW Forced-Air Registers.



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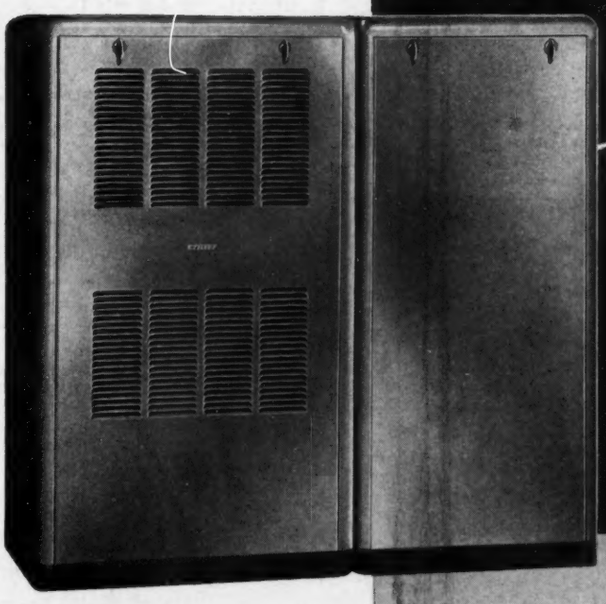
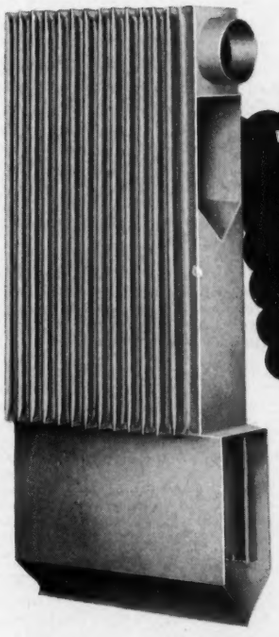


SURE, IT'S NEW— THAT'S WHY IT'S *Better*

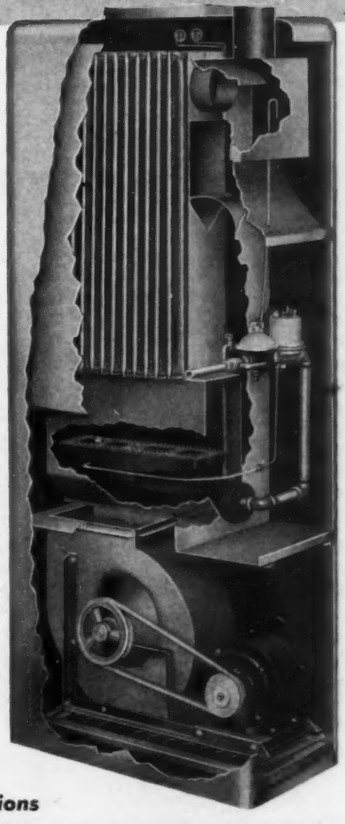
Like airplanes, heating equipment gets out of date quickly. Utility's new forced air furnaces are completely modern—extremely compact—highly efficient and economical.

Gas Fired

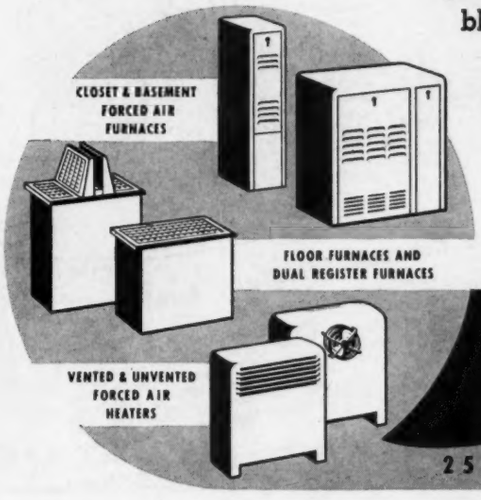
UTILITY FURNACES



The *Uni-Therm* Heating Element in Utility Furnaces is *Guaranteed* Against Burnout Forever



Among the other outstanding new features in Utility Furnaces are the hollow-baffle, multiple-fin construction that multiplies heat transfer and prevents critical temperatures . . . specially designed, dynamically balanced Utility blower...completely automatic controls . . . Fibre-Glas Dust-stop filters... built in draft diverter.



For complete specifications and prices, write today

UTILITY FAN CORPORATION

Los Angeles

2528 SANTA FE AVENUE, LOS ANGELES, CALIFORNIA

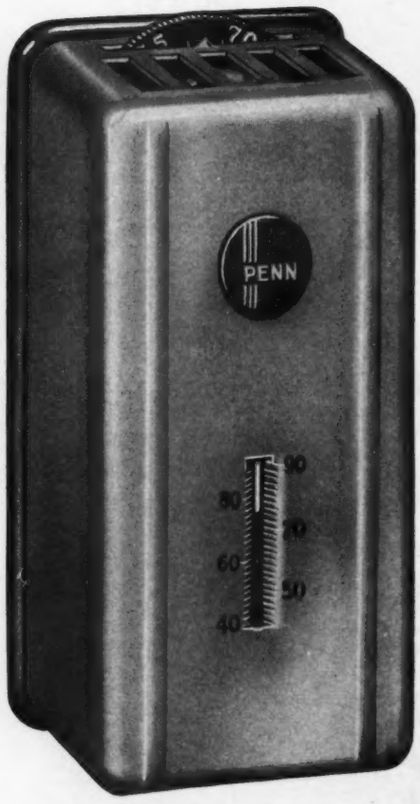
For Heavy Duty Jobs, Try this Compact, Modern Style Thermostat

How often, in the past, have you installed a big, out-of-date thermostat on a circulator, unit heater or blower job, just because a really modern appearing, small, compact line voltage thermostat wasn't available?

Every year, more and more such installations are made in locations where an attractive thermostat is a real asset in making the sale. Wherever such an installation is made, a thermostat that is both accurate and attractive will do much to make satisfied customers and new prospects for you.

Penn has designed the Type 874A01 Thermostat to meet this need for a heavy duty line voltage thermostat that is durable for heavy duty work, accurate for genuine automatic comfort control, and styled for the most modern surroundings.

Here is a thermostat that is no larger than many of the low voltage pilot thermostats on the market today. Sensible streamlining of the exterior and restrained use of decorative features actually make this thermostat appear even smaller than it really is. The deep drawn brass cover, finished in neutral dull antique silver and framed by a narrow molding of the bakelite base, presents a pleasing exterior that is "at home" in any location.



New, but Service-Proved Features do the Work

Experienced heating engineers and installation men will recognize in this *new* thermostat many of the basic features that have made Penn Types A and B heavy duty thermostats so serviceable and so satisfactory over years of service. Yet, even these basic features have been refined and improved by Penn engineers for greater simplicity of design and more accurate temperature control, without sacrificing trouble-free performance and long life, even at maximum load.

Service-proved advantages of Penn Type 874A01 Thermostats include the permanent magnet type, snap-acting electrolytic silver contacts, incorporating an Alnico magnet, the most powerful and most permanent magnet yet devised. A simple differential adjuster makes possible instant adjustment, *by the installation man*, to fit any application, yet, because this adjuster is concealed under the cover of the control, tampering by uninformed users is discouraged.

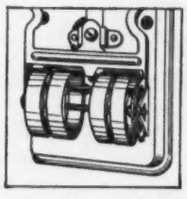
Sturdy brackets are used for mounting the operating parts on the base. These, plus a light but strong angle or "L" section frame which supports all adjustment tension during extremes of temperature, assure continuously satisfactory performance over many years. Penn's method of seasoning bimetal temperature elements by repeatedly and alternately subjecting the bimetal, after working, to extremes of temperature far above then far below operating temperatures, assures permanent accuracy of calibration.

Designed to Save the Installation Man's Time

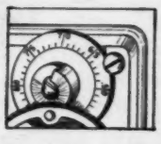
Install a Penn Type 874A01 Thermostat. You'll decide that an installation man must have designed it. Every possible installation time saving feature has been built into this thermostat.

Molded terminal barriers on the back of the bakelite base serve as wire guides to simplify wiring and prevent stray strands from "shorting" between terminals. Mounting plate supplied fits standard outlet box (see below). Two mounting screws which attach the thermostat to the mounting plate are located so that "shorting" the thermostat circuit while mounting is virtually impossible.

Penn Electric Switch Co., Goshen, Indiana. In Canada: Powerlite Devices, Ltd., Penn Electric Switch Division, Toronto, Ont. Export: 100 Varick Street, New York City. Branches and representatives in principal cities.



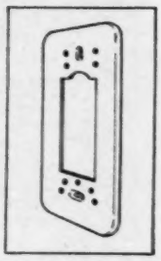
NEW BIMETAL DESIGN provides an extremely powerful temperature element, yet assures prompt response to even small changes in air temperature. Single piece bimetal is slotted so that air movement is over all coils and all surfaces, providing extremely accurate temperature control.



DIAL is bakelite, plainly marked for all settings. Located at top for convenience in making desired changes. A dial lock screw under the cover takes care of jobs requiring locked setting—inaccessible to user . . . convenient for installer. Dial is double insulated from current carrying parts of the thermostat.

MAGNET CONTACT ACTION, originated by Penn, with improvements which include the new, powerful Alnico magnet, handle the current carrying job in the Type 874A01. Note the generous size of the electrolytic silver contacts, as shown at the right. Contacts open and close with the armature mass moving at full speed. Rated to 1 H. P. 110-220 V. A.C. 10 A. Non-Ind. 110 V. A.C. 7½ A. Non-Ind. 220 V. A.C. Pilot Service .5 A. to 250 V. A.C. or D.C.

MOUNTING IS EASY with the Type 874A01. Regularly supplied with mounting plate which fits standard outlet box. Wall mounting on new installations is simplified by roughing-in box and wiring with other electrical work. Thermostat can then be mounted after walls are finished. Or, suspended mounting under a unit heater on a short run of conduit is equally easy. Special conduit box available on order.

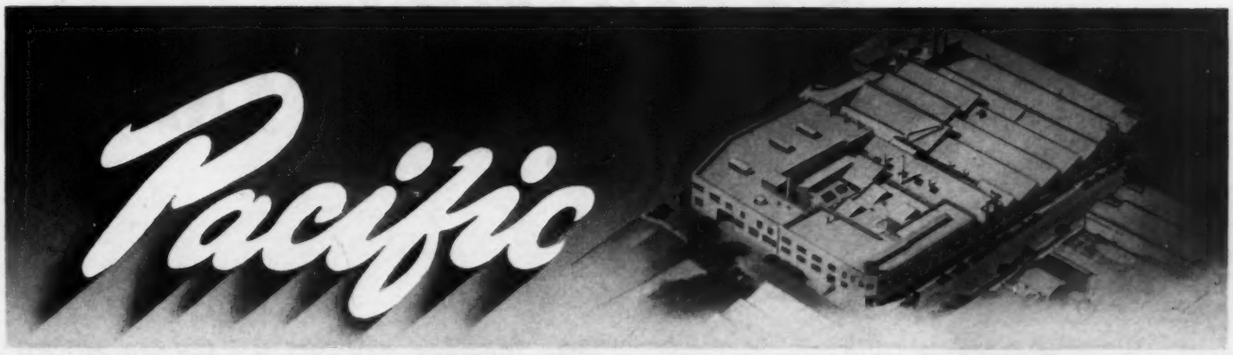


More information on what Penn Controls will do for you—One of a Series.

PENN

Penn-Built Controls for Many Applications

Thermostats, Bonnet Controls, Ductstats, Fire Protection Controls, Water Temperature Controls, Boiler Pressure Controls, Boiler Water Level Controls, Humidistats, Stack Switches, Stoker Timer Relays, Solenoid Gas Valves, General Purpose Relays, Solenoid Refrigerant and Water Valves, Refrigeration Pressure and Temperature Controls, Water Valves, Pump Controls, Air Compressor Controls, Air Volume Controls, Line Starters.



BEAT COMPETITION WITH THIS LOW COST FORCED-AIR FURNACE

Capacity for All Heating and Ventilating Requirements

ADAPTABLE to successful solution of the most difficult combination heating and air-conditioning problems in all types of buildings, this compact, efficient, low cost "Pacific"-Manufactured Gas-Fired Furnace is available in a complete range of sizes from 50,000 to 550,000 B.T.U. input. Unsurpassed performance has won acceptance everywhere for Model 8SFB, with sales rapidly increasing.

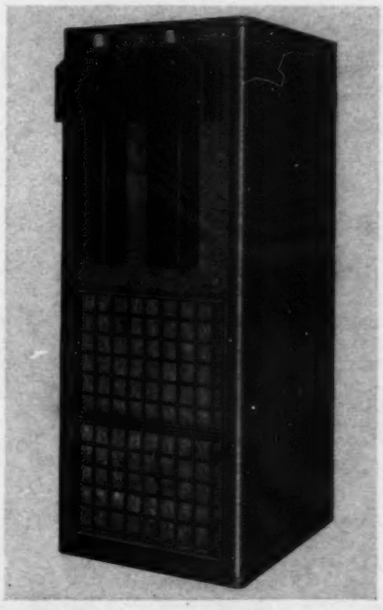
NEW TYPE HEATING ELEMENT

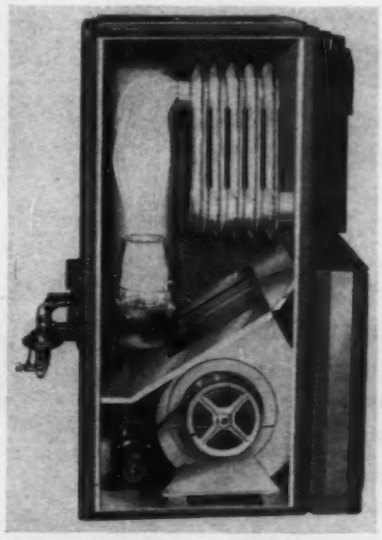
AN innovation in gas furnace design and construction is the round combustion chamber and radiator of *heavy rust-resisting steel* welded into a one-piece gas-tight leak-proof unit.

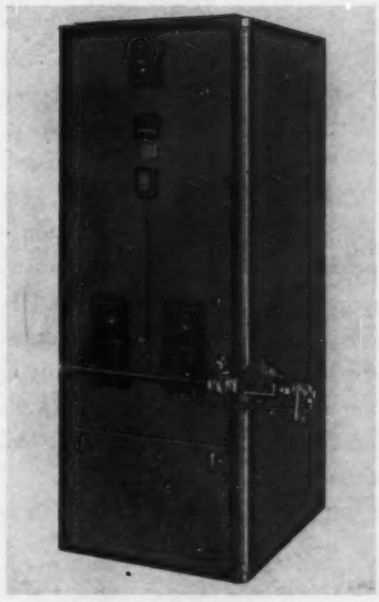
HIGHER EFFICIENCY, LONGER LIFE

SO RAPID is heat transference that through this element the maximum heating power is reached a moment after the gas is turned on. This is accounted for by increased effective radiation area, increased air flow, longer combustion travel, and the all-steel construction. These factors, together with the "Pacific" venturi-type round burner, combine to extract the maximum heat units from the fuel consumed and transmit them to the inner warm air passages in the shortest possible time. Heat emission is constant throughout the performance range.

To prolong the life of the all-steel element, a heavy cast-iron fire-box liner just above the burner protects the side walls of the combustion chamber from contact with the flame.







LEFT: Venturi-type round burner with primary air adjustment. Raised flame tips permit scientifically perfect secondary air and gas mixture.

Above burner is heavy cast-iron fire-box liner.

QUIET, POSITIVE AIR DELIVERY

THE BLOWER is a powerful improved multi-blade type, equipped with Fafnir "Life-Time" lubricated steel ball bearings (no oiling required) and mounted in rubber pillow blocks for quiet operation. Variable speed adjustment permits change in air volume for winter and summer.

CORRECT SIZE FOR EVERY NEED

AS the Heating Element is of the sectional type, any number of elements may be assembled in the one casing to provide a furnace size for any requirement. When assembled in multiples, an interconnecting passageway permits flame travel from the pilot to each burner successively.

WRITE today for complete details . . . step up sales and profits with this and other popular "Pacific"-Manufactured Gas-Fired Furnaces—*a complete line!*

PACIFIC GAS RADIATOR CO.

MAIN OFFICE AND FACTORY — **HUNTINGTON PARK, CALIF.**

27 Successful Years — *. . . and Still Growing !*

"No red ink on our PROFIT STATEMENT"

Richard Mansfield of James Mansfield and Sons Co., Chicago, {at left in photo with his father and brother, Clarence} one of the largest firms in the Midwest specializing in sheet metal, has a lot of faith in Toncan Iron because of its effect on his balance sheet. During the Company's Golden Anniversary year he makes these comments —

● "Our work as roofers and sheet metal contractors involves both residential and industrial jobs. For every type of exterior or interior application where sheet metal is suitable, we use Toncan* Iron. Here's why:

"Work in the shop moves along quickly, because we have no trouble with hard spots in the sheets, nor is there any flaking. In addition, in all the years we have used Toncan Iron we have never had a single complaint on the metal.

"But most important to all of us are cost figures. Here is a 'spec' right here that involves a bid of $577.00 based on using a popular non-ferrous material — which is supposed to last a lifetime — yet for $315.00, indicating a $262.00 saving, the buyer can have Toncan Iron, which *we guarantee for twenty years.* Ordinary steel for the same job would cost only five dollars less than the Toncan, yet would not survive nearly as many years. I can't see how anyone can justify anything but Toncan Iron.

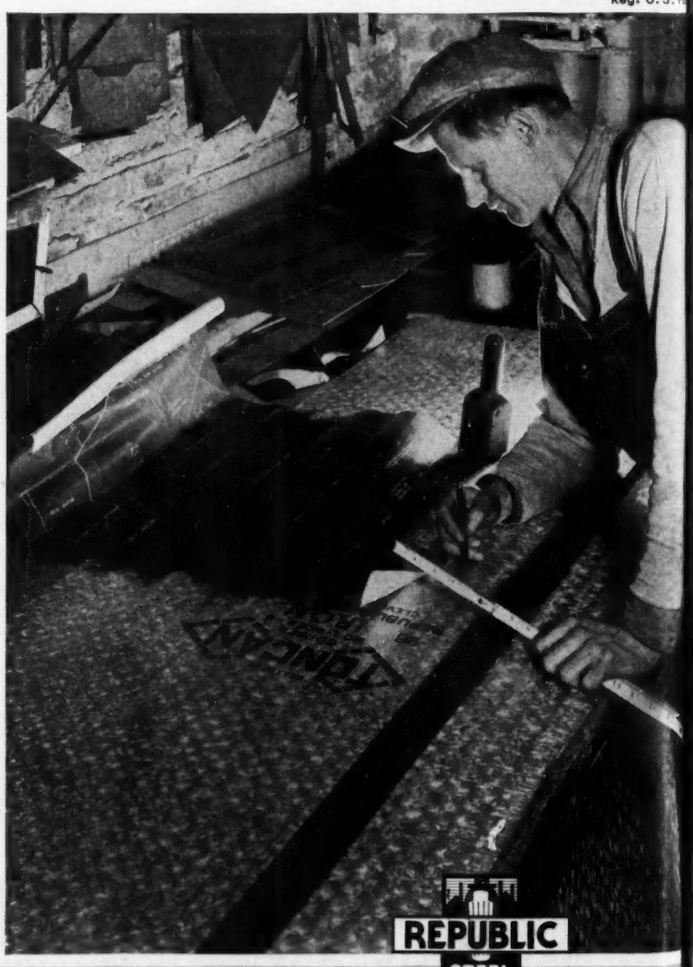
"And I know from experience what I am talking about on service life. Actually, the supposed high-priced 'lifetime' material has an average life of only twenty-five to thirty years in this territory, yet I can show you scores of our Toncan Iron jobs that have withstood twenty or more years. Dad put Toncan gutters and spouts on his own home eighteen years ago, and today they are in excellent condition. They probably will last at least another ten years.

"Costs and profits are important to every man in our trade. That's why Dad founded this business fifty years ago on the slogan 'not how *cheaply* I can do it, but how *well.*' And the fact that Dad established such a fine record under this policy makes Clarence and me sentimental to feel that the reputation of this shop is at stake every time we accept a job. The result is that we can't afford to take chances. That is one big reason why long ago we standardized on Toncan Iron. It has been many a year since we have had any kind of sheet metal in this shop except Toncan Iron.

"Is our policy sound? Well, it's been a long time since we've seen red ink on our profit and loss statement."

Booklet 186 — "The Path to Sheet Metal Permanence" — tells the story of Toncan Iron. Ask for a copy — writing Republic Steel Corporation, General Offices, Cleveland, Ohio.

*Reg. U. S. Pat. Off.



REPUBLIC STEEL
REG U S PAT OFF

REPUBLIC TONCAN IRON

An alloy of refined open-hearth iron, copper and molybdenum
— that grows old slowly

BERGER MANUFACTURING DIVISION
NILES STEEL PRODUCTS DIVISION
STEEL AND TUBES DIVISION
UNION DRAWN STEEL DIVISION
TRUSCON STEEL COMPANY

Vol. 109 American Artisan No. 11

Warm Air Remains in All Defense Specifications

WE SUGGESTED last month that readers could render our industry a service by writing their congressman and senator saying that the warm air heating industry can and will fulfill any need of the rearmament program. That the industry has the production facilities to build and the contractors needed to install any program—no matter how large it may be and despite the fact that rearmament building is concurrent with the largest fall volume this industry has ever enjoyed.

Many readers evidently did write their congressman and senator. And many writers sent copies of their letters to the National Warm Air Heating and Air Conditioning Association office in Columbus, Ohio for what ever additional use the letters might be.

It is not too late to write even now. Though the decision is made, such letters will signify approval of what has been decided upon just as strongly as they recommend some action. If you did not write—do so.

It is our understanding—though not officially verified at this writing—that the National Defense Commission (Knudson committee) with concurrence by all other interested agencies has accepted this industry's statement of ability to fill contracts and decided to leave warm air heating in all defense program housing specifications. They have decided against the radiator heating industry's plea that warm air heating be thrown out of some specifications.

This is a signal victory. It is a victory which goes far beyond its first glance implications. Consider this aspect—millions of impressionable young American's will, during the next few years, spend at least one winter in barracks heated by forced warm air. If they are comfortable; if forced warm air heat is healthful—they will take away with them an appreciation of warm air heating which no amount of money can buy. These men are, of course, our future home builders and buyers.

And consider this—these warm air heated encampments are being built in every part of the United States. Areas where forced warm air has as yet gained only slow acceptance will have first-hand and substantial proof of the advantages of this form of heating. This first hand proof of value also is beyond purchase.

Incidently, the question of our industry's ability to furnish large sized units (250,000 Btu output and up) was raised and may have aroused some question in the minds of readers. The National Warm Air Association surveyed this situation and reports that the capacity of the industry is at least 4,000 such units per month today with increases likely whenever any letdown in dealer stocks demand occurs.

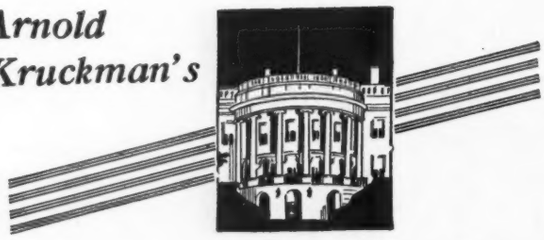
First hand evidence of the scope and importance of this victory may be had from a reading of Arnold Kruckman's Washington Letter in this issue. We published a brief summary of heating projects in the October issue. This October summary did not specify what was involved in each project nor specify whether heating or what kind of heating was called for.

So for this November issue we asked Mr. Kruckman to list all projects far enough along to classify. This summary has been arranged by States and projects and tells briefly what the project is and roughly what type of buildings are called for. We call attention especially to the dozens of "housing" projects, meaning thereby, single, multiple, or apartment dwellings for occupancy by persons engaged in war work.

The point of chief interest we believe is first—the magnitude of this phase of rearmament and, secondly—the tremendous heating market thus established. Not far behind these in importance is the evident fact that while camps, rearmament manufacturing buildings, posts, cantonments may be a gigantic project lasting a few months, housing in connection therewith will, in all likelihood, require months, perhaps years, for completion. From this phase of rearmament, the warm air heating industry may confidently look for a long

(*Continued on page* 110)

Arnold Kruckman's



Washington Letter

NATIONAL defense building, military and civil, involves more complicated business considerations than are superficially apparent. To go into the fine shades of difference in this letter would require more space and more understanding than this writer commands. Here are the major points to remember if you are concerned with the projects enumerated below. Some are planned, supervised, paid for, and used wholly by the Federal Government. These range from cantonments and munitions plants to homes for workers. Others are planned by private industry, paid for by private industry, supervised jointly by Federal Government and private industry, and may eventually become the property of Government or private industry. These range from factories to homes for workers. Others are financed by Government, built by private industry and may or may not be owned by industry when they have served their purposes. And there are the projects **guaranteed** by Government but theoretically resting upon the credit of private persons or corporations. FHA, USHA, Farm Security, RFC, and other Federal agencies are involved in most transactions of this type. It is impossible to define many types of the projects according to these classifications. Those interested in any of the following jobs should, therefore, find out for themselves in every instance the precise arrangement.

Including Oct. 15th, $1,088,299,157.70 had been **allocated** and awarded for all national defense building to be owned and paid for by the Federal Government. It is difficult to determine how much has actually been awarded and how much has been allocated. Allocation was the pre-election circumlocution for a contract promised or dangled but not actually delivered.

Agencies Handling Work

Defense housing, as forecast in these columns, has been assigned for supervision chiefly to the Public Buildings Administration. The dwellings, ranging in cost from $3,500 to $3,800 each, will be two bedroom frame or masonry structures, from one-family to eight-family buildings. Warm air furnaces are indicated using the fuel common to the local area. Over 200,000 such dwellings will eventually be built.

Public Buildings Administration will function almost solely for the Army. The Navy will build its own housing, but using the same general plan. The FHA, under a subordinate corporation known as the Defense Home Corporation, will build homes for workers and others along the general lines of other FHA operations. USHA continues to operate through local Housing Authorities. Federal Home Loan Bank Board helps to stimulate the supply of capital where needed; and the Farm Security Administration tackles the housing job in rural areas where new defense factory communities are being carved out of the farming area. The Soil Conservation Service—Land Acquisition Division—of the Department of Agriculture acts as agent for the Army, the Navy and similar services, in selecting and purchasing land that may be required for any defense projects.

Scope of the Program

You can get a birdseye view of what is happening if you sense some of the highlights. San Diego, California, for instance, is being rapidly developed into one of the greatest naval bases in the world. San Pedro, the port of Los Angeles, virtually unified with Long Beach, just below, is another huge expansion operation for the Navy including every imaginable type of construction and building. The whole San Francisco area is peppered with mushrooming projects of the Army and Navy.

The area from Spokane to Puget Sound is a chain of extraordinary operations. Utah, near Wendover, is the scene of the greatest Air Corps bombing range in the world. Salt Lake City is expected to be center for the largest military encampment in America. In Missouri, Indiana, Michigan, Ohio, Virginia, Alabama, Arizona, Texas, and other States, great new industrial communities are being carved out of the open country. And everywhere you may find one of 400 Posts, Cantonments, Camps, and Air Corps Stations, scattered around the United States.

Huge sums are being spent for expansion in the Navy Yards and private shipbuilding yards of New England, along the Atlantic Coast, the Gulf Coast and the Pacific Coast. Brooklyn alone has some $500,000,000 for Navy expenditures, not counting the funds spent on the ships themselves. Corpus Christi in Texas is the center for a wide and enormous Navy and marine activity. Pascagoula in Mississippi will rapidly force its way into public notice. And in the interior, and up along the Great Lakes, towns that have been industrially shut down for years—Sidney Hillman calls them "ghost towns"—are being revived with a rush. One Wisconsin town, Manitowoc, has become one of the chief, if not the chief, submarine building centers of the United States.

Definition of Camp, Cantonment, Post, Etc.

The following enumeration must necessarily specify types of building in the briefest and most general terms. Posts, Cantonments, Camps and Air Corps Stations may be more clearly understood in detail by this summary. A Post, one of the permanent Army centers, used as a Reception Center for recruits is being expanded by 30 buildings. These include an Administration Building, Recruit Receiving Building and Warehouse, Guard House, Fire Station, Infirmary, Post Exchange, Recreational Building, Officers' Quarters and Mess, Barracks, Cafeterias, etc. A Cantonment is a permanent military community, usually composed of wooden buildings. It will shelter from 20,000 to 50,000 men. Here are outlines for a Cantonment that will be the home of 20,000 troops. It will have 850 buildings, consisting of barracks, messhalls, storehouses, day rooms, Officers quarters, Administration buildings, fire stations, guard house, post office, telephone exchange, radio building and equipment, Post Exchange, theaters, service club, recreation buildings, warehouses, motor repair shops, gas and oil stations, utility shops, infirmaries, hospitals, laundry, bakery, refrigeration plant, incinerator, magazines, utilities, target ranges. And there will be the usual fringe of private housing and private businesses.

A Camp, in theory, is a tented town. Actually it often is made up of wooden buildings, wholly or in part. A typical tent camp has about 450 buildings. They usually include officers mess buildings, enlisted men's messes, officers' quarters, Administration offices and buildings, fire stations, post offices, telephone and telegraph buildings, post exchanges, recreation buildings, service clubs, infirmaries, utility shops, motor repair shops, warehouses, gas storage buildings, incinerators, radio building, bakery, laundry, cold storage buildings, magazines, target ranges, lavatories, nurses quarters, barracks, medical clinics, surgical clinics, wards, storehouses, morgue, heating plants.

A typical Air Corps Station has 120 buildings in addition to special hangars. The buildings include barracks, day rooms, enlisted men's mess, officers' mess, cafeteria,

(*Continued on page* 94)

AMERICAN ARTISAN

RESIDENTIAL AIR CONDITIONING SECTION

DEVOTED TO HOME AND SMALL COMMERCIAL AIR CONDITIONING

Cleaning Efficiency HIGHER
Dust Storage Capacity GREATER
Period of Service without attention LONGER
Resistance to air flow LESS
Cost based on life of filter LOWER
Maintenanced by washing and recoating with viscosine - costs less Than 5¢

High Quality at Lowest Cost!

The outstanding advantages of the American A-C make it the most economical filter for unit air conditioners and warm air conditioning units where washable features are desirable and dust conditions are not abnormally severe.

A-C Filters are furnished in three thicknesses—1", 2" and 4". The 1" and 2" cells, without frames, are available in standard sizes and can be made to order in special sizes when necessary. The 2" and 4" are also furnished in frame units.

Engineering data and installation details helpful in installing A-C Filters are given in Bulletin No. 67. Write for your copy.

AMERICAN AAF AIR FILTERS

AMERICAN AIR FILTER COMPANY, INC.
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A-C *Washable Type* **PERMANENT FILTER**

Technical Code—*Precalculated*

By Henry Aronson

Field Engineer, Premier Furnace Co.

Most contractors admit that the Technical Code is our most comprehensive design method, but many hesitate to adopt the code because of the time required to figure a job using the code. The author of these articles faced the same problem, but, instead of forgetting the code, he transferred all calculations to charts and tables so that practically no mathematics are needed and each entry can be read directly from precalculations.

IN an effort to establish definite design and installation standards for forced warm air heating systems, the National Warm Air Heating and Air Conditioning Association developed and introduced the Technical code. This code, as the association emphasized, is comprehensive enough to cover practically any type or size of residential system. A system that has been designed and installed according to the code will contain the latest and best features and will have sufficient provision for nearly all contingencies. No practices that are experimental or controversial will be included. The code is the most generally accepted procedure available today.

However, there has been considerable criticism of the code, leveled principally at the code's complications. Some common criticisms are, "It takes too long to design a system according to the code." Or—"The code is fine for large intricate systems, but is too complicated for average houses." Or "The code goes to extremes to attain perfection, and we cannot sell perfection competitively."

Technical Code's Good Features

On the credit side, we should remember that the Technical Code is not a radically new idea—it is a specific adaptation of the BTU method of design, upon which all methods are originally based, and follows ASH&VE recommendations. Most of its provisions are confirmed by University of Illinois tests. While it is true that it may later be improved and simplified, it is at present our most logical approach to a universal and logical standard, and everyone designing forced warm air systems should be familiar with it. The code is just one of the tools of the trade.

This article, and the articles to follow, are not an attempt to "sell" the code. The articles do recognize, however, that the code is the most comprehensive effort to consolidate engineering progress of the industry and standardize design procedure. Also these articles recognize that increasing numbers of local ordinances incorporate the code wholly or in part and insist that heating plants be installed accordingly. Too, many local construction and loan agencies insist on standardized calculations and all accept the code's provisions as adequate. It seems only a matter of time before FHA will insist on some such uniform method and the method will probably be the Technical Code or something very similar.

In a great many cases it is not necessary to go through all the various steps of the code. On small jobs particularly, where the smallest available unit has plenty of excess capacity, some liberties may safely be taken, so long as nothing is done that goes *below* the minimums of the code. Naturally, standard sizes of stacks, registers, and fittings have to be used, so some variation is inevitable. The code recognizes these needs.

Every Job Is Different

It is seldom that a system can be installed exactly according to plan. Pipes, wires, structural changes require some deviation from the original plan. This means that the designer must not cut corners too closely and thereby leave nothing over for increased resistance due to changes in air flow characteristics. There is also the unknown quantity due to the difference in mechanical ability of the fabricators and installers. The writer has checked any number of jobs designed by himself and others and has found that to obtain comfort conditions, the actual velocities, capacities, and temperatures will not correspond too closely to those anticipated by the designer. If the resist-

CUBICAL CONTENTS, ROOMS WITH 11 FT. CEILINGS

	5	5½	6	6½	7	7½	8	8½	9	9½	10	10½	11	11½	12	12½	13	13½	14	14½	15	16	17	18	19	20
5	275																									
5½	303	333																								
6	330	363	396																							
6½	358	393	429	465																						
7	385	424	462	501	539																					
7½	413	454	495	536	578	619																				
8	440	484	528	572	616	660	704																			
8½	468	514	561	608	655	701	748	795																		
9	495	545	594	644	693	743	792	842	891																	
9½	523	575	627	679	732	784	836	888	941	993																
10	550	605	660	715	770	825	880	935	990	1045	1100															
10½	578	635	693	751	809	866	924	982	1040	1097	1155	1213														
11	605	666	726	787	847	908	968	1029	1089	1150	1210	1271	1331													
11½	633	696	759	822	886	949	1012	1075	1139	1202	1265	1328	1392	1455												
12	660	726	792	858	924	990	1056	1122	1188	1254	1320	1386	1452	1518	1584											
12½	688	756	825	894	963	1031	1100	1169	1238	1306	1375	1444	1513	1581	1650	1719										
13	715	787	858	930	1001	1073	1144	1216	1287	1359	1430	1502	1573	1645	1716	1788	1859									
13½	743	817	891	965	1040	1114	1188	1262	1337	1411	1485	1559	1634	1708	1782	1856	1931	2005								
14	770	847	924	1001	1078	1155	1232	1309	1386	1463	1540	1617	1694	1771	1848	1925	2002	2079	2156							
14½	798	877	957	1037	1117	1196	1276	1356	1436	1515	1595	1675	1755	1834	1914	1994	2074	2153	2233	2313						
15	825	908	990	1073	1156	1238	1320	1403	1485	1568	1650	1733	1815	1898	1980	2063	2145	2228	2310	2393	2475					
16	880	968	1056	1144	1232	1320	1408	1496	1584	1672	1760	1848	1936	2024	2112	2200	2288	2376	2464	2552	2640	2816				
17	935	1029	1122	1216	1309	1403	1496	1590	1683	1777	1870	1964	2057	2151	2244	2338	2431	2525	2618	2712	2805	2992	3179			
18	990	1089	1188	1287	1386	1485	1584	1683	1782	1881	1980	2079	2178	2277	2376	2475	2574	2673	2772	2871	2970	3168	3366	3564		
19	1045	1150	1254	1359	1463	1568	1672	1777	1881	1986	2090	2195	2299	2404	2508	2613	2717	2822	2926	3030	3135	3344	3553	3762	3971	
20	1100	1210	1320	1430	1540	1650	1760	1870	1980	2090	2200	2310	2420	2530	2640	2750	2860	2970	3080	3190	3300	3520	3740	3960	4180	4400
21	1155	1271	1386	1502	1617	1733	1848	1964	2079	2195	2310	2426	2541	2657	2772	2888	3003	3119	3234	3350	3465	3696	3927	4158	4389	4620
22	1210	1331	1452	1573	1694	1815	1936	2057	2178	2299	2420	2541	2662	2783	2904	3025	3146	3267	3388	3509	3630	3872	4114	4356	4598	4840
23	1265	1392	1518	1645	1771	1898	2024	2151	2277	2404	2530	2657	2783	2910	3036	3163	3289	3416	3542	3669	3795	4048	4301	4554	4807	5060
24	1320	1452	1584	1716	1848	1980	2112	2244	2376	2508	2640	2772	2904	3036	3168	3300	3432	3564	3696	3828	3960	4224	4488	4752	5016	5280
25	1375	1513	1650	1788	1925	2063	2200	2338	2475	2613	2750	2888	3025	3163	3300	3438	3575	3713	3850	3988	4125	4400	4675	4950	5226	5500
26	1430	1573	1716	1859	2002	2145	2288	2431	2574	2717	2860	3003	3146	3289	3432	3575	3718	3861	4004	4147	4290	4576	4862	5148	5434	5720
27	1485	1634	1782	1931	2079	2228	2376	2525	2673	2822	2970	3119	3267	3416	3564	3713	3861	4010	4158	4307	4455	4752	5049	5346	5643	5940
28	1540	1694	1848	2002	2156	2310	2464	2618	2772	2926	3080	3234	3388	3542	3696	3850	4004	4158	4312	4466	4620	4928	5236	5544	5852	6160
29	1595	1755	1914	2074	2233	2393	2552	2712	2871	3031	3190	3350	3509	3669	3828	3988	4147	4307	4466	4626	4785	5104	5423	5742	6061	6380
30	1650	1815	1980	2145	2310	2475	2640	2805	2970	3135	3300	3465	3630	3795	3960	4125	4290	4455	4620	4785	4950	5280	5610	5940	6270	6600

ance turns out to be less than calculated, the air flow can be dampered down, but it is awfully hard to damper it up.

Also to be remembered, if you take six different houses, all built to the same plan, size and specifications by six different contractors—some variation in heat loss will show in all of them. Some contractors build a nice tight house; others are pretty careless. Lumber and materials vary. Occasionally there is chiseling on specifications. Don't cut corners too closely.

This might sound like a good reason for not figuring jobs to a standard or being too careful, but actually it is the best reason in the world for knowing exactly what you do and why. Ordinarily variations are minor and the code allows enough leeway to take care of such contingencies. In all cases there is need for plain common sense, for without common sense all the theory in the world is useless. There will always be jobs so much out of the ordinary that even the code may seem dubious. In such cases consult an independent engineer or manufacturer.

One basic advantage of the Technical Code is that it takes care of each problem in design in its logical sequence and furnishes a complete step-by-step evidence of just what was done when the system was designed. The writer has seen houses which were supposed to be insulated but never were. The heating contractor of course calculated the job on the basis of the specifications furnished him. Naturally the heating system was inadequate, but the responsibility did not rest with the heating contractor where he could show his data sheets, and indicate just how the system was figured and sized.

Charts Based on Actual Use

The writer of these articles has to figure a lot of jobs and figure each job so it will work. This calls for a lot of time spent in figuring. Any tables that cut down time without sacrificing accuracy were used. However, it was not possible to find just what was wanted and, necessity being the mother of invention, the writer made up the tables and charts which will accompany these articles. Using these tables and charts any Technical Code installation can be designed with very few mathematical computations. The general idea cuts down the amount of time involved and, at the same time, none of the essentials are skipped.

The use of tables or charts is of course, nothing new. Some of the writer's are based upon ideas several years old, but ideas which have

CUBICAL CONTENTS, ROOMS WITH 12FT. CEILINGS

	5	5½	6	6½	7	7½	8	8½	9	9½	10	10½	11	11½	12	12½	13	13½	14	14½	15	16	17	18	19	20
5	300																									
5½	330	363																								
6	360	396	432																							
6½	390	429	468	507																						
7	420	462	504	546	588																					
7½	450	495	540	585	630	675																				
8	480	528	576	624	672	720	768																			
8½	510	561	612	663	714	765	816	867																		
9	540	594	648	702	756	810	864	918	972																	
9½	570	627	684	741	798	855	912	969	1026	1083																
10	600	660	720	780	840	900	960	1020	1080	1140	1200															
10½	630	693	756	819	882	945	1008	1071	1134	1197	1260	1323														
11	660	726	792	858	924	990	1056	1122	1188	1254	1320	1386	1452													
11½	690	759	828	897	966	1035	1104	1173	1242	1311	1380	1449	1518	1587												
12	720	792	864	936	1008	1080	1152	1224	1296	1368	1440	1512	1584	1656	1728											
12½	750	825	900	975	1050	1125	1200	1275	1350	1425	1500	1575	1650	1725	1800	1875										
13	780	858	936	1014	1092	1170	1248	1326	1404	1482	1560	1638	1716	1794	1872	1950	2028									
13½	810	891	972	1053	1134	1215	1296	1377	1458	1539	1620	1701	1782	1863	1944	2025	2106	2187								
14	840	924	1008	1092	1176	1260	1344	1428	1512	1596	1680	1764	1848	1932	2016	2100	2184	2268	2352							
14½	870	957	1044	1131	1218	1305	1392	1479	1566	1653	1740	1827	1914	2001	2088	2175	2262	2349	2436	2523						
15	900	990	1080	1170	1260	1350	1440	1530	1620	1710	1800	1890	1980	2070	2160	2250	2340	2430	2520	2610	2700					
16	960	1056	1152	1248	1344	1440	1536	1632	1728	1824	1920	2016	2112	2208	2304	2400	2496	2592	2688	2784	2880	3072				
17	1020	1122	1224	1326	1428	1530	1632	1734	1836	1938	2040	2142	2244	2346	2448	2550	2652	2754	2856	2958	3060	3264	3468			
18	1080	1188	1296	1404	1512	1620	1728	1836	1944	2052	2160	2268	2376	2484	2592	2700	2808	2916	3024	3132	3240	3456	3672	3888		
19	1140	1254	1368	1482	1596	1710	1824	1938	2052	2166	2280	2394	2508	2622	2736	2850	2964	3078	3192	3306	3420	3648	3876	4104	4332	
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21	1260	1386	1512	1638	1764	1890	2016	2142	2268	2394	2520	2646	2772	2898	3024	3150	3276	3402	3528	3654	3780	4032	4284	4536	4788	5040
22	1320	1452	1584	1716	1848	1980	2112	2244	2376	2508	2640	2772	2904	3036	3168	3300	3432	3564	3696	3828	3960	4224	4488	4752	5016	5280
23	1380	1518	1656	1794	1932	2070	2208	2346	2484	2620	2760	2898	3036	3174	3312	3450	3588	3726	3864	4002	4140	4416	4692	4968	5244	5520
24	1440	1584	1728	1872	2016	2160	2304	2448	2592	2736	2880	3024	3168	3312	3456	3600	3744	3888	4032	4176	4320	4608	4896	5184	5472	5760
25	1500	1650	1800	1950	2100	2250	2400	2550	2700	2850	3000	3150	3300	3450	3600	3750	3900	4050	4200	4350	4500	4800	5100	5400	5700	6000
26	1560	1716	1872	2028	2184	2340	2496	2652	2808	2964	3120	3276	3432	3588	3744	3900	4056	4212	4368	4524	4680	4992	5304	5616	5928	6240
27	1620	1782	1944	2106	2268	2430	2592	2754	2916	3078	3240	3402	3564	3726	3888	4050	4212	4374	4536	4698	4860	5184	5508	5832	6156	6480
28	1680	1848	2016	2184	2352	2520	2688	2856	3024	3192	3360	3528	3696	3864	4032	4200	4368	4536	4704	4872	5040	5376	5712	6048	6384	6720
29	1740	1914	2088	2262	2436	2610	2784	2958	3132	3306	3480	3654	3828	4002	4176	4350	4524	4698	4872	5046	5220	5568	5916	6264	6612	6960
30	1800	1980	2160	2340	2520	2700	2880	3060	3240	3420	3600	3780	3960	4140	4320	4500	4680	4860	5040	5220	5400	5760	6120	6480	6840	7200

Many charts and tables will have to be reproduced with each of the articles in this series. Some precalculations, like the two cubical contents tables shown here, require numerous tables. It will be necessary, therefore, to publish "extra" tables with most articles. Readers will have to file these tables for past or future reference.

proved practical. Every effort has been made, during several years of constant use, to develop tables and charts which are easy to apply and are immediately understandable. Some which the writer attempted to use took more time to figure out how to use them, than it took to make the calculations. This criticism also applies to the technical code where the user doesn't use it often enough and has to stop and study the details of procedure.

The writer does feel that the tables and charts which will be shown in this series of articles follow a definite continuity and have been arranged for a specific purpose-figuring procedure. The writer does not have any pet principles of design to "put over" except that the idea be as simple as possible. There are, and will be arguments in favor of, and against, high registers-low registers; high velocities-low velocities; single returns-multiple returns; first floor-second floor returns, outer wall supplies, inside returns and many other theories.

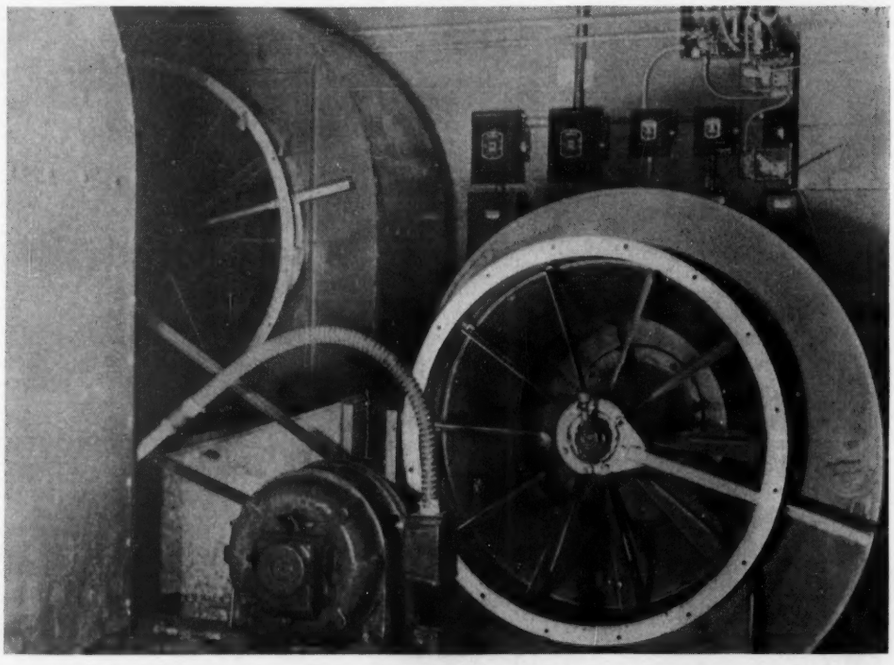
In the writer's opinion all of these ideas will work properly if the complete system is correlated to the idea and necessities are not skimped in order to favor the "pet" idea. All design should follow some standard so that the contractor will know, in general, just how and why he did certain things and also to reduce the time spent in trying to adapt an obscure theory to a given condition. Novel ideas are sometimes just another sales stunt. The industry progresses from trying new things, but most experiments should be worked out in the laboratory, not on the job.

First Step Is Heat Loss

The first step in applying any equipment or designing any system is to calculate the heat losses. The next step is to determine the size of the equipment needed. The third step is to determine the best method of distributing the heat generated to the various parts of the structure in the proper proportions. To determine heat losses, either by room or for the full house, one of the steps necessary is to obtain the cubical contents of the rooms to be heated. Numerous tables have been prepared and published. The writer's tables offer no great difference from the previous tables, with the possible exception of their scope. They are being published, however, in order that a complete set of tables and charts will be available on completion of these articles.

These tables are arranged for common ceiling heights. Two tables are shown here and others will follow until ceiling height tables for 7½, 8, 8½, 9, 9½, 10, 11 and 12 feet are published. With

(*Continued on page* 114)



Above—Exterior of the new and modern Longfellow School in Waterloo. Right — Two of the main system air conditioning fans, one each for a heating zone. Note the fan inlet dampers which operate in conjunction with the outside air intakes to maintain a constant air supply volume.

Air Conditioning In a Modern School

By Meryl L. Todd

Consulting Engineer, Waterloo, Iowa

THE Longfellow elementary school, Waterloo, Iowa, is a strictly modern building costing approximately $350,000. It was built to replace two or three obsolete grade schools and includes about 28 classrooms, an auditorium, gymnasium and offices, accommodating about 1,000 students. The two story structure is approximately 300 ft. long. enclosing about 797,365 cu. ft. Every effort was made to coordinate the heating and ventilating system and to make the system as modern as the building itself. It was designed for complete automatic control of the temperature, quantity and quality of the air within the building. The entire system was zoned to maintain a definite standard of air quality throughout the building with a maximum of operating economy. Conditioned air is admitted into each classroom upward along the outside walls, the temperature being controlled by individual room thermostats. All equipment and material, with the exception of those pieces requiring regular observation or attention, were either partially or completely concealed.

Heating and Ventilating System

The heating and ventilating system is essentially a central plant consisting of four zones, each having booster coils in the branch ducts to each classroom for the control of temperature. The four zones (the north, east, south and west sides of the building) are independently controlled so as to compensate for sun effect, etc. The east zone is supplied with approximately 15,000 cfm of air, the west zone with 12,500, the south zone with 7,500 and the north zone with 4,000. The duct distribution system required slightly more than 60,000 lb. of sheet metal, this portion of the heating and ventilating contract amounting to about $10,000.

The heating and the ventilating are accomplished by the same system, the air leaving the central station at a temperature of from 60 to 70 F depending upon the zone requirements, and being heated to a maximum final temperature of 135 F by the booster coils in the ducts to each room. Thirty cubic feet of air per occupant is circulated throughout the building, a minimum of 12 cfm of air being introduced from outdoors whenever the building is occupied.

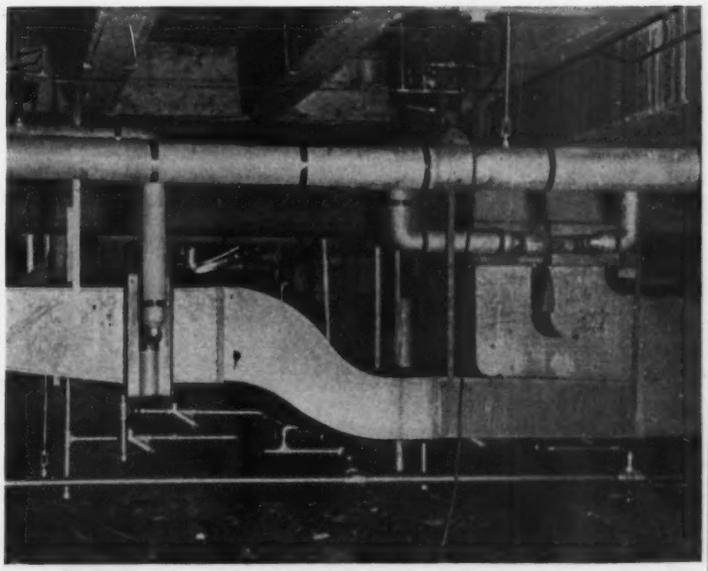
An outdoor air duct extends from the equipment space below ground to the roof of the building. In the equipment space the outdoor air duct combines with the recirculating duct from each zone of the building, and a common duct then extends to the central ventilation station. There the air passes through a double bank of adhesive type filters to a preheater section, consisting of "tube-within-a-tube" type extended surface heaters. From the preheater the air enters the air washer, and is discharged from there into the fan room, which serves as a plenum for the incoming air.

Supply and Return Ducts

In the fan room are backward curve type fans with variable inlet vanes for each zone. The fans and motors are set on soundproof bases and are connected to the main supply ducts extending beneath the center of the building to the various zones.

The air leaving the fan for each zone passes through a reheater coil with face and bypass dampers and through a set of fire and air dampers. Each main duct in the building is equipped with an automatic fire damper and with an air damper that closes whenever the zone fan is not in operation so that the air is not pulled back through the inlet of the zone fan.

From the main zone supply duct the air is uniformly distributed to the branch ducts leading to the classrooms. In each branch take-off is an automatically controlled booster coil of the extended surface type. The branch duct, taken from the top of the main supply duct, splits to provide two outlets along the outside walls of each average classroom of 40 students.



Ducts at a point where first and second floor branches leave the supply main. Note the auxilliary booster heating coils controlled by the room thermostat.

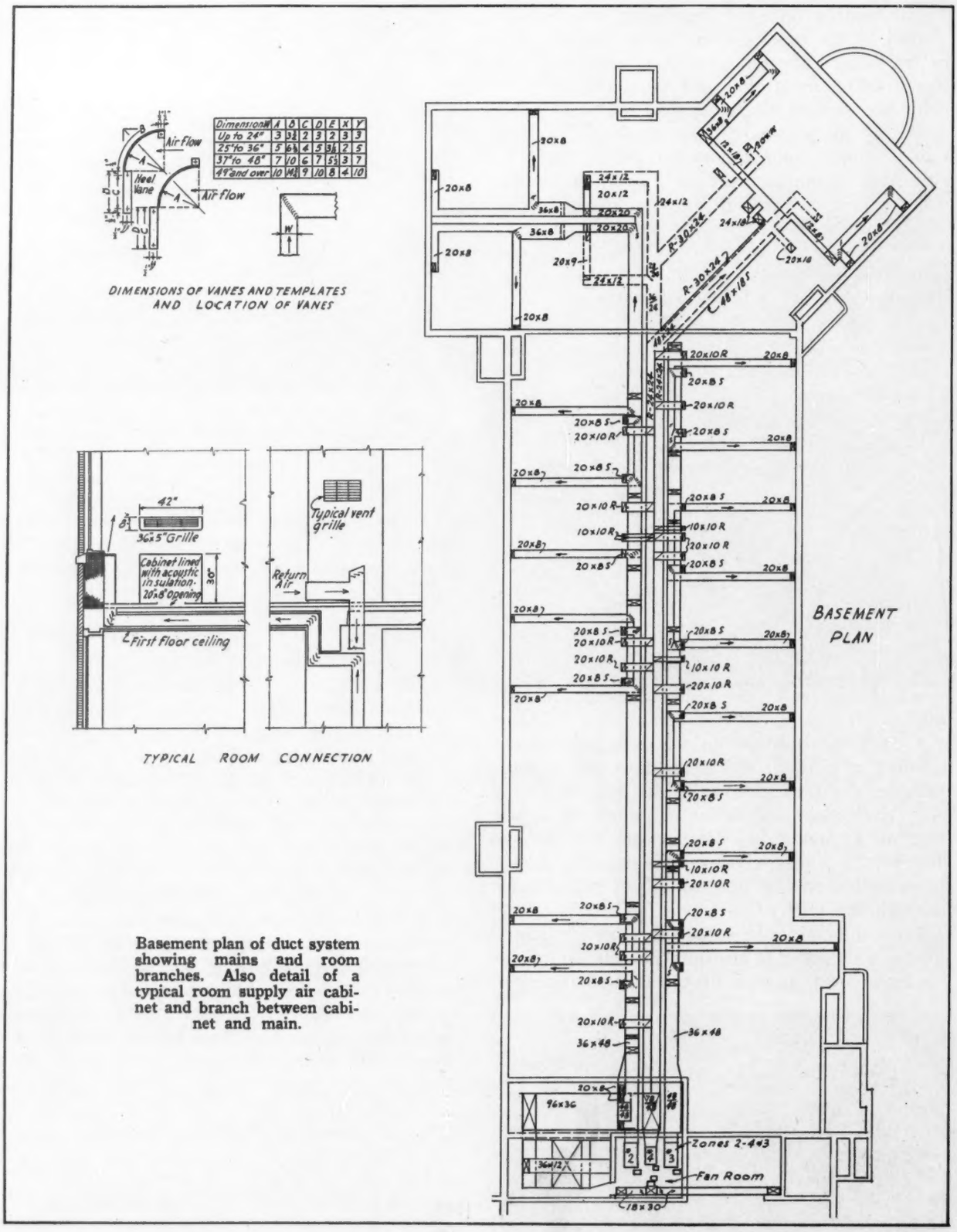
The branch ducts for the first floor rooms extend parallel to the main duct until they are opposite the openings to the classrooms. From there a horizontal, acoustically insulated branch extends at right angles, connecting with the classroom opening beneath the building.

The branches from the main supply duct for the second floor involve a similar booster coil arrangement and run parallel to the main duct above the first floor branch duct until in line with the openings that extend vertically from the center of the building behind the locker space on the first floor to the floor slab of the second floor. The classroom ducts are carried across the ceiling of the first floor between the concrete joists. There are two branch ducts, fully insulated and approximately 20 in. by 8 in. in size, to each classroom. Along the outside wall these connect through the floor to the distribution cabinets as on the first floor.

Special Air Distribution Cabinets

The air is distributed in each classroom from two acoustically treated cabinets situated beneath the windows along the outside wall, or from similar size acoustically lined spaces built into the cabinet work of the classroom. In either case two outlets with directional flow grilles approximately

Supply ducts were built with standing seam stiffeners on the outside. Return ducts had the standing seam stiffeners on the inside. Left is the inside of a return duct.



Basement plan of duct system showing mains and room branches. Also detail of a typical room supply air cabinet and branch between cabinet and main.

36 in. by 5 in. supply air upward along the outside wall. The normal amount of air from an outlet is 600 cfm, the velocity averaging 500 fpm.

The special cabinets—used in the classrooms where the outlets are not built into the wood cases along the walls—were constructed by the sheet metal contractor of 16 ga material with all corners rounded so as to match the general appearance of the convection heaters installed in various parts of the building. The grilles set flush in the top of them.

At the time of construction, the bottom of the cabinet was entirely enclosed so that the 20 in. by 8 in. opening could be cut into it on the job to cen-

ter the outlet on the window, since the spaces between the joists in all rooms did not necessarily center themselves on the windows. The interiors of these cabinets were lined with acoustical insullation and, where necessary, directional baffles were provided to distribute the air evenly from the outlet grilles in the tops. Baffles were not usually required since the cabinets serve as sound deadening plenum chambers, the resulting velocity being very uniform.

This system of distribution of the air to the classroom is equally satisfactory whether the air is entering the room at a temperature above that being maintained or below it.

Air Circulation

The air stream is fanned along the outside wall, and the temperature of the stream is always in accordance with the amount of heat loss from the space, thereby blanketing the cold wall. By this arrangement the temperature of the primary air stream is not more than 4 or 5 deg. above the room temperature when it reaches the ceiling during periods of maximum final temperatures from the booster coil.

The velocities from the outlets were carefully selected to set up enough secondary air flow in the classroom to maintain the movement in the occupancy zone at from 15 to 50 fpm, as well as to maintain small temperature differentials between the floor and ceiling. There are no down drafts along the outside walls to cause discomfort to the students, which sometimes occurs when air blows horizontally from the inside wall toward the outside wall, especially if radiation is not provided. Also, the floor temperatures throughout the room are only a degree or two below the thermostat temperature, since infiltration and down drafts from the windows are offset by the vertical stream of air.

The return air, including the air that is to be vented to the outdoors, leaves the room through a recirculating grille connected by means of a short duct to the return riser extending to the main return duct beneath the building. At the point where the grille duct connects to the riser, in the space behind the lockers, is an exhaust opening to the air space between the lockers and the partition of the classroom in which is situated a balanced back draft damper that opens in relation to the amount of outside air being introduced to the classroom. Air leaves this space through vent grilles, passes into the corridors and is exhausted from the building through rotary roof ventilators or through the toilet exhaust system.

Only the discharge and return grilles and the room controls are exposed in the classrooms, everything else in the distribution system being entirely concealed within the building construction.

The Sheet Metal Work

The fabrication and installation of the duct work was contracted to the firm of A. J. Schultz and Sons of Cedar Rapids, Iowa. Duct work was fabricated in complete sections in small sizes and in panels in larger ducts and trucked to the job for erection.

The installation of the sheet metal, involving about 55,000 lb., proved to be comparatively easy for the contractor, largely due to his method of procedure.

The openings for all the ducts were placed by the sheet metal contractor rather than by the general contractor, and at the same time hanger bolts were installed in the concrete form work for all main and branch lines. There were approximately 120 openings in the first and second floor slab, and 500 or more hanger bolts.

As soon as the first floor slab was poured, complete measurements were taken of all openings as they actually existed for use in the preparation of shop drawings. Drawings were made of each main line and its branches and were carefully checked to be sure that the metal could be installed without interference with other lines or piping. These drawings were also checked with the other crafts on the job to be sure that the sheet metal could be installed as delivered without complications.

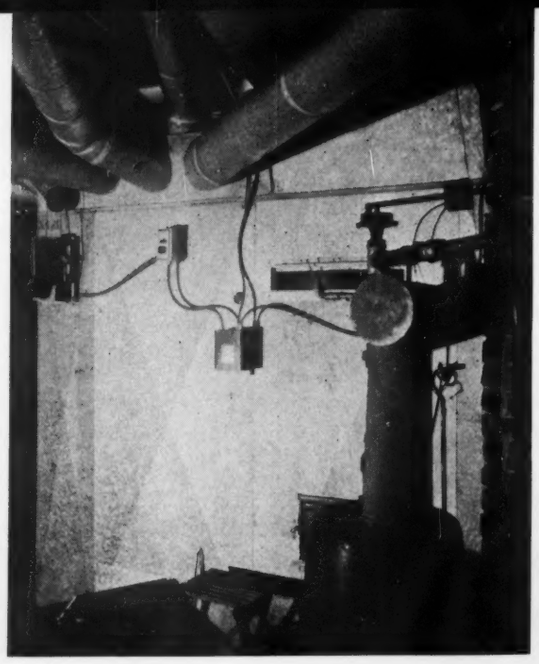
Duct Fabrication and Erection

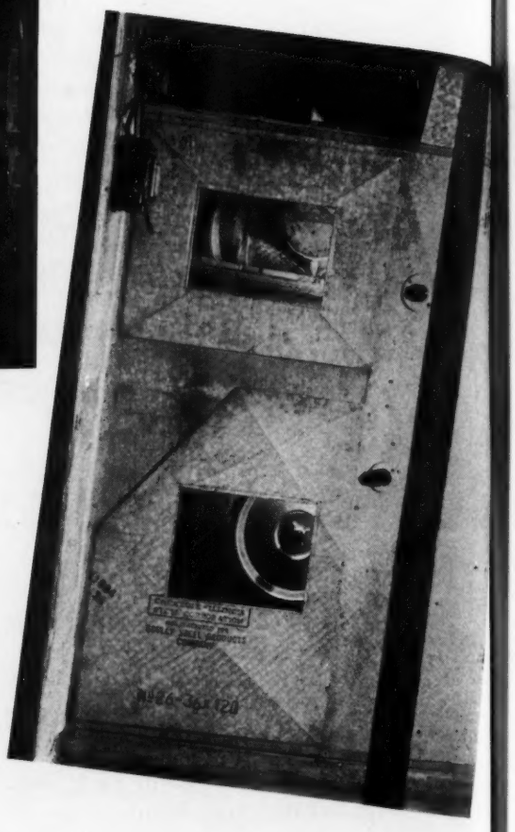
All main lines were constructed with 1 in. standing seams. All panels were cross broken to provide further rigidity. The branch ducts were made with slips and drives, with corner seams made on a lock forming machine.

Before fabrication, all duct sizes were checked and sheets were selected to provide a minimum of waste on the entire job. Ninety-five per cent of the sheet metal used was cut in the squaring shears, so that only marking and notching were done by hand.

Only two men were required on the job for erecting the sheet metal work as delivered from the shop. Only the housing around the equipment was built on the job. Six months were required to complete the installation of the sheet metal work.

The architect for this school was M. B. Cleveland; Wheatland Co. was the heating contractor; and the sheet metal work was done by A. J. Schultz & Sons. The author was the consulting engineer.





Above and left—Round pipe supplies coming off the top and sides of the bonnet. The unusual location of the zone dampers in the bonnet automatically groups leaders of each zone along one side. Right — Glass inspection doors through which prospects can watch the system working. (Installation in contractor Ludwig's own home.)

A 5-Zone, Replacement System With

Zone Dampers In the Furnace Bonnet

A COUPLE of years ago contractor Ervin Ludwig, Ottawa, Illinois, purchased a large, old house, with the idea of remodeling the interior to make one apartment for himself and other apartments for rent. As the idea finally worked out, the house was made into two apartments on the first floor, two apartments on the second floor and a completely new apartment on the third floor which Mr. Ludwig now occupies.

The first and second floors were originally heated by one gravity furnace with floor registers and one large cold air return in the first floor. The attic originally was unfinished. Drastic remodeling was carried on throughout. Two kitchens and two baths were laid out on the first and second floors and the two original apartments divided. All new rooms were laid out on the third floor, the ceiling was insulated, an attic fan installed.

The old heating plant was ripped out; floor registers and returns were floored over and a new forced air system was installed. All new wall stacks were run, registers were placed in side walls about 6 ft. 8 in. from the floor, baseboard returns were run from every apartment. In the new system there are five returns from the first floor, 5 returns from the second, and 4 returns from the third floor.

Knowing how difficult it can be to satisfy several tenants from one thermostat, contractor

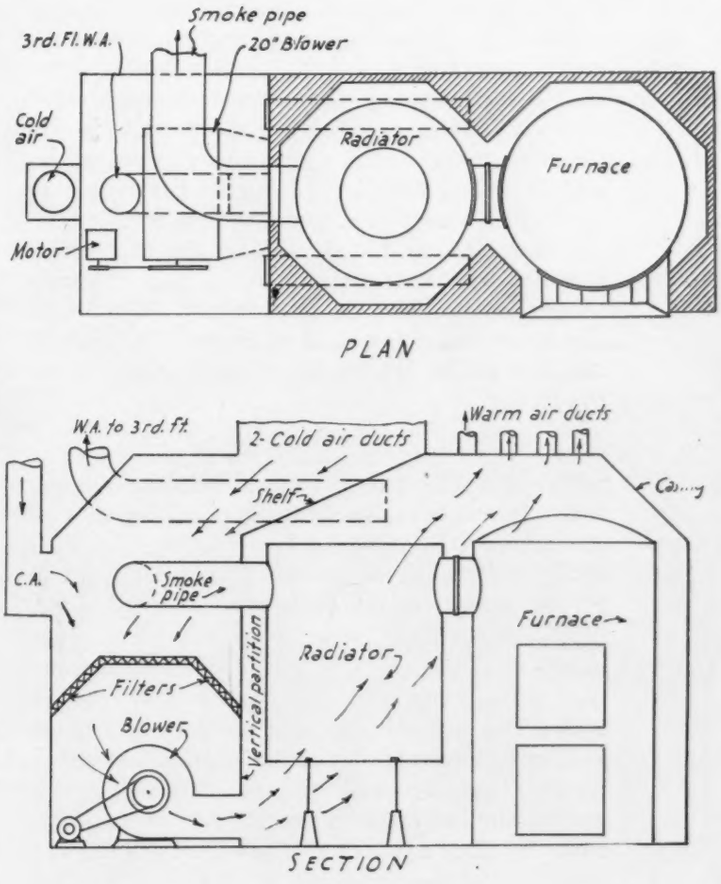
Ludwig decided to make each apartment a zone so that individual temperatures could be maintained in the building. This zoning called for five thermostats and five damper motors.

To minimize attention a bin-feed stoker was installed.

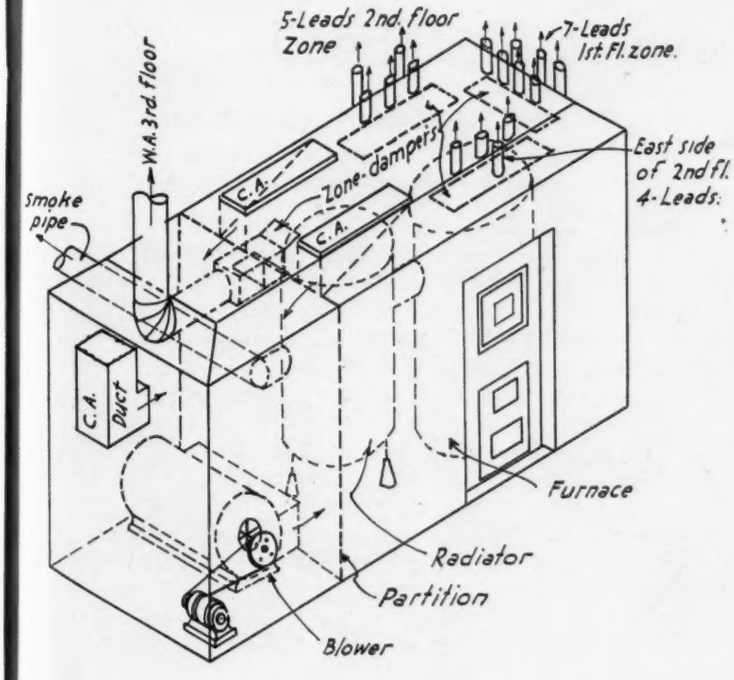
Zone Dampers in Bonnet

The method of zoning the duct work is the most interesting feature of the installation. Unlike usual practice, the zoning is accomplished in the bonnet of the furnace, utilizing an ingenious idea worked out by contractor Ludwig. The method is shown in the sketches. The furnace used is a steel Weir with a cylindrical radiator. A special casing was built, dividing the interior into two compartments. The front compartment contains the furnace drum, the radiator and the zone dampers. The rear compartment contains the blower, filters, smoke pipe, humidifier. A shelf was built above the radiator, as shown in the elevation, so that the two cold air trunks enter the housing directly above the radiator but the air does not touch the radiator until it leaves the blower and filters. The shelf and the vertical partition make the division of space.

The casing around the drum and radiator was baffled off as shown in the furnace plan and above the drum the three sides were fitted with dampers

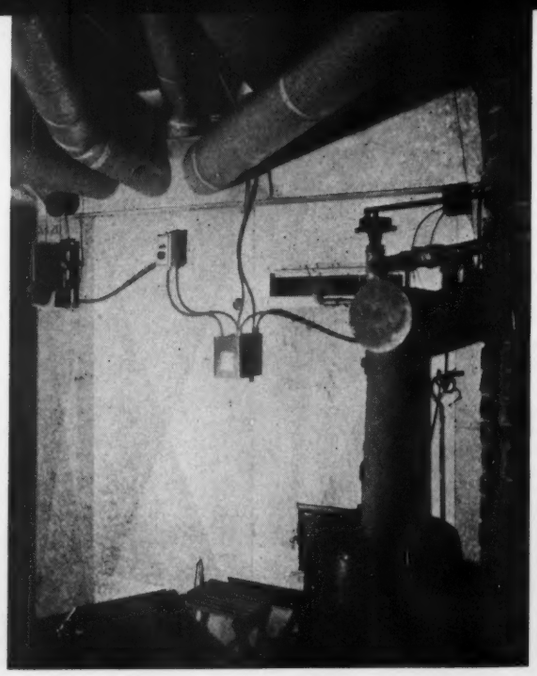


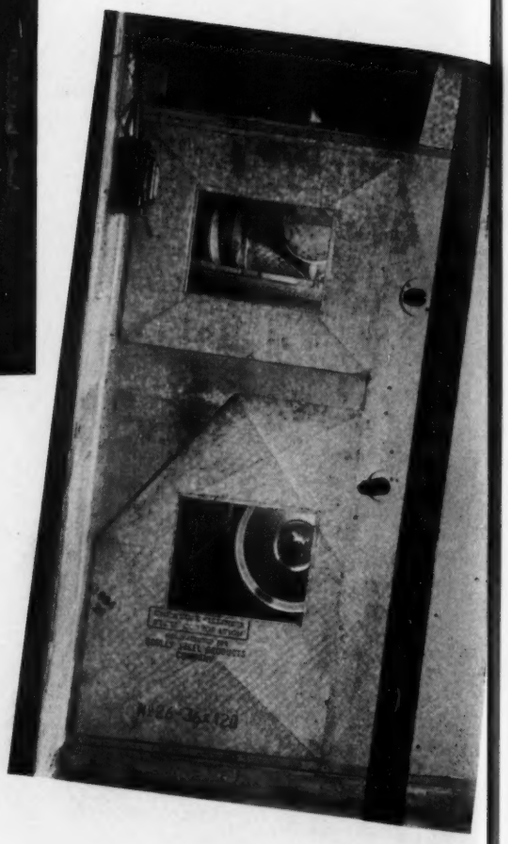
The plan, elevation and isometric drawings show how the bonnet is arranged for the zone dampers. When a damper stands upright the zone is closed—when the zone thermostat calls for heat the damper falls back, and the stoker starts. When closed, approximately 20 per cent of the zone damper area is open to "bleed" excess heat into the rooms. The special casing was baffled as shown. Both combustion drum and radiator (Weir, cylindrical radiator) are in the "hot side." Note upright partition and shelf which separates cold from hot sections. Details are not to scale.



which stand up when the zone is closed and fall back to the outside of the casing when the zone is open. This arrangement, in effect, forms three boxes around the three sides of the casing. The warm air pipes open off the top of the boxes. When a zone is satisfied the damper stands up cutting off the pipes of the zone from the space through which warm air flows. When a zone calls for heat the damper swings outward opening the box and, hence, the zone pipes to the warm air stream. The damper motors are mounted on the casing and connect with the damper through linkage.

The zone to the third floor had to be handled somewhat differently. A rectangular duct extends back from the plenum to the back of the casing and the damper is placed in the duct. The duct changes to a 14-inch round pipe which goes up to the space between the third floor new ceiling and the roof and branches out to the registers in this space.





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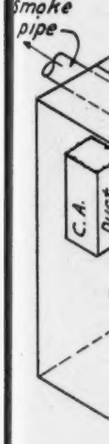

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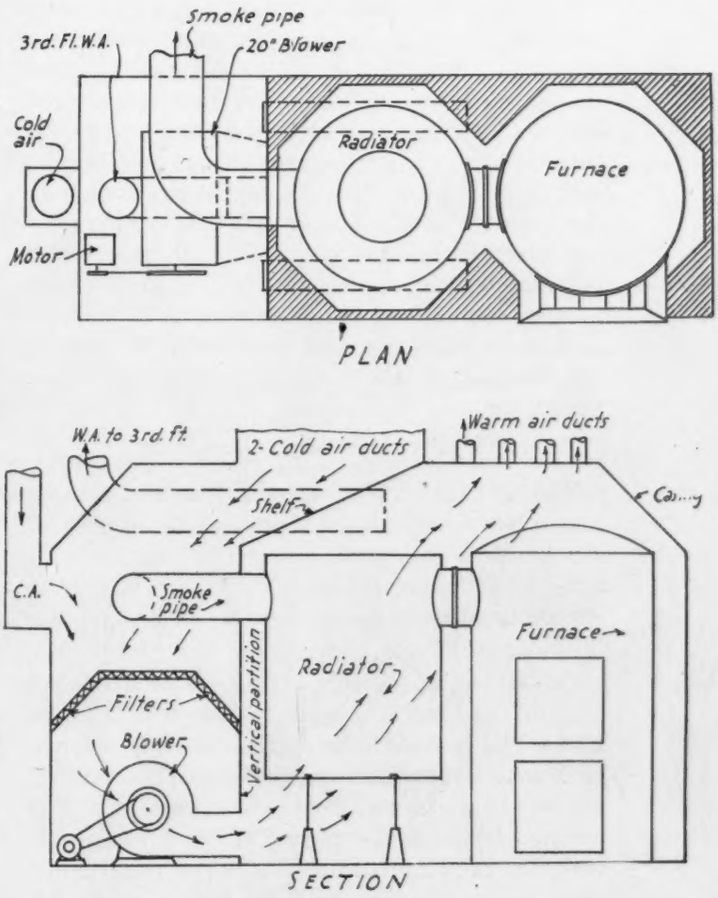

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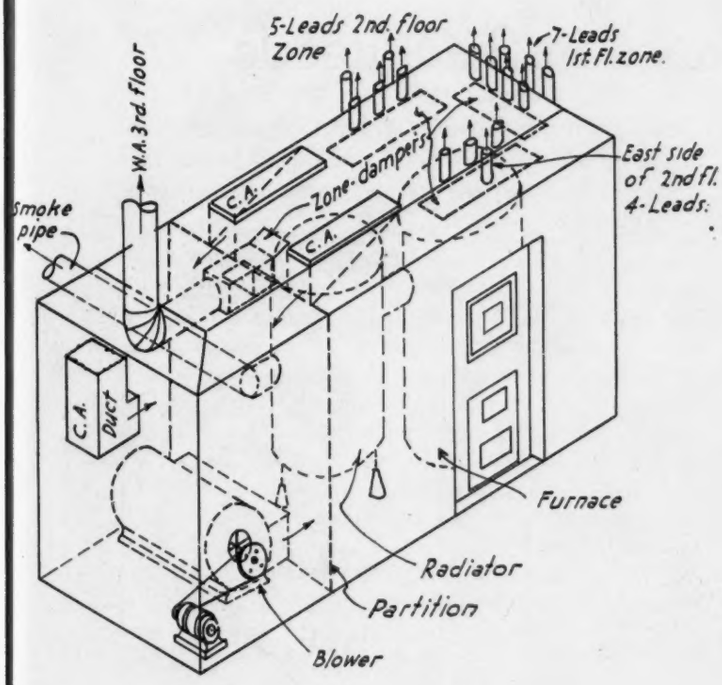

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The control system is standard practice. Any thermostat calling for heat starts the stoker by opening its zone damper. The fan switch starts the blower when bonnet temperature reaches 160 degrees. The fan runs until the bonnet temperature falls to 120 degrees, even though the thermostat is satisfied earlier. A high limit switch in the bonnet stops the stoker any time bonnet temperature reaches 180 degrees. Each thermostat is connected to its zone motor so that the zone damper opens when the thermostat calls for heat and closes when the zone thermostat is satisfied. An integral switch in the damper motor starts the stoker.

Effect of "Bleeding" Excess Heat

The dampers are so hinged that the damper never completely closes. Some small amount of air can flow into each zone when the fan runs after all zones are satisfied. This is primarily to relieve bonnet temperature, but also has another interesting effect. The zone dampers, when closed as far as possible, still leave about 20 per cent of the zone area open for air flow into the zones. The reduced volume of air flowing through each zone issues from the registers at low velocity and tends to "float" across the ceiling. This ceiling blanket helps to maintain room temperature, but does not seriously over-run the thermostat. When the zone calls for heat and the full air volume comes from the registers, this ceiling blanket is quickly dissipated and helps to start the temperature upward immediately.

Since the installation is in Contractor Ludwig's own home and can readily be shown to prospects, the casing was provided with glass sight doors as the photographs show. One window looks into the rear compartment on the humidifier side. Another shows the rear compartment at the filter and smoke pipe level. Still another shows the blower and blower motor. The fire door has a peep sight through which the fire can be viewed.

The return from the third floor is also a clothes chute made possible by this fitting at the bottom of the stack. The trap door is weighted to stay closed unless manually opened by the pull chain.

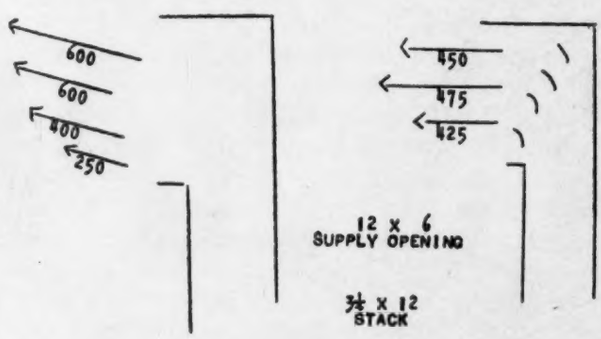
All round pipe was used for warm air runs. Seven and 8-inch pipe was used and any rooms requiring more than an 8-inch pipe capacity were given two seven's. For balancing purposes each round pipe has a damper close to the bonnet.

Effect of Turning Vanes in Stackheads

MOST contractors know that a turn in a duct materially affects the flow of air beyond the turn. Professor Konzo, in his book, "Winter Air Conditioning," states that an elbow with no inside radius has a friction equal to 52 pipe diameters. An elbow with an average inside radius has a friction of only 11 diameters. Also, the use of turning vanes in a no-radius elbow cuts friction from 52 to 11 diameters.

If turning vanes have such an effect in duct elbows, how about their effect in stack heads? Turning vanes are equally advantageous here. Tests at Michigan State College show these results—With an unequal face velocity it is difficult to determine the "carry" of an air stream. With high side wall registers part of the flow may strike the opposite wall at too high a velocity and cause drafts. On a baseboard register, unequal face velocity requires a larger register to eliminate too high a velocity at the face. Equal face velocity, obtained by turning vanes is, therefore, advantageous.

—J. H. Von Alsburg at the Jan. N.W.A.H.&A.C. Convention.



Condensation Problems in Modern Buildings*

[Part 2]

By L. V. Teesdale

Senior Engineer, U. S. Dept. of Agriculture Forest Service
Forest Products Laboratory, Madison, Wisc.

TESTS have been made to determine comparative vapor resistance of various papers and wall materials used in building construction. Samples were sealed in copper pans containing water and exposed in a room controlled at 80 deg. F. and 30 per cent relative humidity, and weighed regularly for 90 days or more. The values obtained after the rate of loss became constant were calculated on a basis of grains of moisture lost per square foot per hour. (See table 1.)

This is only a partial list of the materials tested up to the present time, and, as the tests are incomplete, it will be subject to change as required with further work. Many of the materials have been tested under actual exposure conditions in laboratory test-house wall panels.

Figure 4 shows the moisture content of the sheathing in 3 test wall panels, differing only in type of vapor barrier used. These walls were of conventional frame construction, lath and plaster, stud space filled with rock wool, wood sheathing, asphalt impregnated and surface-coated sheathing paper and siding. Panel No. 1 had a vapor barrier made of aluminum foil mounted on paper; No. 2, asphalt impregnated and surface-coated sheathing paper weighing 50 pounds per roll of 500 square feet; and No. 3 had no special barrier. Starting about November 1 the sheathing shows a gradual increase in moisture content for each type, most rapid where no barrier is used. Even with a barrier there is a definite pickup until in the case of No. 2 a moisture content of about 17 per cent is reached, indicating that the inflow of water vapor exceeds the outflow until a certain balance is obtained. After that time conditions were nearly static until the outside weather conditions moderated, and then the outflow exceeded the inflow. Conditions did not become static in the case of No. 3, the moisture continuing to build up until the change in outside temperature raised the sheathing temperature above the dewpoint. After that time No. 3 began to dry out. This particular panel was quite badly blue stained whereas the other two panels were clean and bright. From these data and other observations it appears that for conventional frame walls with fill insulation the permeability of the vapor barrier should not exceed 0.600 grains per square foot per hour on a basis of the values given in Table 1 for houses where humidities are maintained at or about 40 per cent in normal winter weather having short periods of zero weather. Where exposed to extended periods of weather below zero the vapor barrier should have greater resistance. For walls having less insulation, less resistance is required in the vapor barrier, other factors being alike. However, enough data are not available at this time to establish values for all wall types.

The barrier, when located as described on the warm side of the wall, resists the passage of moisture while it is in the form of vapor, and therefore before it has a chance to condense into water. Hence there is no hazard of water forming behind the plaster or other interior wall finish. The barrier also prevents moisture from getting into the wall or attic space during the construction period, particularly during the plastering operation.

For new construction, vapor barriers of highly resistant paper are effective and economical. They should be applied vertically on the interior portion of exterior or exposed side walls with edges lapping

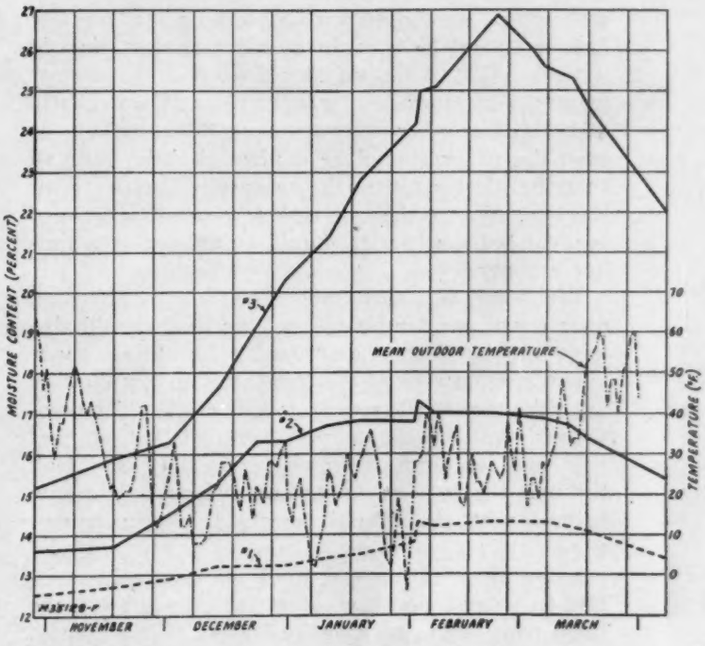


Fig. 4—Curve showing moisture content of wood sheathing during the winter of 1937-38 in Laboratory Test House, with and without vapor barrier.

*Paper presented at the Second Conference on Air Conditioning, University of Illinois, March 8 and 9, 1939.

TABLE 1

Comparative Resistance of Various Materials to Vapor Transmission

Material	Loss in grains per sq. ft. per hour
Foil surfaced reflective insulation (double faced)	0.061–0.093
Roll roofing—smooth surface 40 to 65 lb. per roll 108 sq. ft.	0.093–0.123
Asphalt impregnated and surface coated sheathing paper glossy surfaced—	
50 lb. per 500 sq. ft. roll	0.153–0.555
35 lb. per 500 sq. ft. roll	0.123–1.480
Duplex or laminated papers 30-30-30	0.990–1.850
Duplex or laminated papers 30-60-30	0.370–0.617
Duplex papers reinforced	0.493–1.480
Duplex paper coated with metal oxides	0.370–0.930
Insulation backup paper, treated	0.617–2.462
Gypsum lath with aluminum foil backing	0.061–0.277
Plaster—wood lath	7.90
Plaster—fiber board or gypsum lath	14.20–14.80
Plaster—3 coats lead and oil	2.650–2.770
Plaster—3 coats flat wall paint	3.080
Plaster—2 coats aluminum paint	0.831
Slaters felt	3.700–18.50
Plywood—¼ in. Douglas fir, soy bean glue plain	3.080–4.620
2 coats asphalt paint	0.308
2 coats aluminum paint	0.930
½ in. 5-ply Douglas fir	1.920–1.975
¼ in. 3-ply Douglas fir, art. resin glue	3.080–4.620
½ in. 5-ply Douglas fir, art. resin glue	1.975–2.420
Insulating lath and sheathing—board type	18.50–24.65
Insulating sheathing, surface coated	2.19–3.05
½ in. compressed fiber board	3.640
1 in. insulating cork blocks	4.440
½ in. and 1 in. blanket insulation between coated papers	1.380–1.440
4 in. mineral wool—unprotected	20.950

on the studs after the insulation is installed and before lathing. Horizontal joints should be made only where backed up with a plate or header. The barrier should be brought up tight against electric fixture outlets, air registers, door and window frames, and other similar openings. If wood lath, metal lath, or other types requiring a plaster key are used the paper should be applied slightly loose so that the plaster can push the barrier back to form the key. Where the ceiling below the attic or roof is insulated the barrier should be applied in a similar manner.

Walls finished with such materials as plywood, fiber board, plaster board, and the like, should also have the barrier as described. Sheathing paper when used outside of the sheathing in combination with the moisture barriers described should be water resistant, but not very vapor resistant, so that the small amount of water vapor that may leak through the barrier can escape outward. We now believe that slaters' felt meets this requirement very well.

Some kinds of mineral wool are relatively resistant to water absorption, others are treated to make them resistant to wetting by water. This property, while desirable, does not make these materials resistant to the passage of vapor. Therefore, unless additional vapor resistance be provided, they should not be considered a source of protection against condensation.

Some types of mineral wool have a vapor resistant paper back attached to the bat. Tests to date indicate that these papers average somewhat below the resistance previously specified. They are sufficiently resistant, however, to be of definite help in keeping the insulation and the wall dry, and to warrant proper care in installation. The wool bat is made to fit between standard stud, joist, and rafter spacing with tabs on the paper which extend out from the bat and are tacked to the studs or rafters. The bat may be cut or forced back to obtain the tabs at the end of the bat. Where the spaces are not standard between studs, such as occurs around windows, doors, and dormers, particular care should be taken to obtain good joints, even if it is necessary to use one of the barriers previously described. As yet no suitable provision has been made for sealing the horizontal joints between adjacent bats in the individual stud spaces. Unfortunately we do not know at present just how much protection is needed at this point.

Blanket and Fiber Insulation

Blanket types of insulation are also available where the insulation is enclosed within a heavy paper covering treated with asphalt. Insulations of this type come in various thicknesses, and the vapor resistance of the enclosing envelope can be built up to almost any desired point. It is important that this type of insulation be carefully installed so that vapor cannot work through around the edges. The tabs should be nailed to the face of the studs with the insulation looping loosely inward away from the inner face of the wall, or if installed between studs it should be fastened in place with wood strips.

Fiber board sheathing is often used as a substitute for wood sheathing and it may be used either with or without other insulation. When used with other insulation the methods of protection suggested should be followed. When no other insulation is used the need of a moisture barrier is much less, just as with wood sheathing.

Materials embodying the principle of reflective insulation are in use, but opportunity for observation and tests have been limited. One type having metal foil attached to both sides of a heavy sheet of paper is very resistant to vapor and another type composed of a strong paper faced on both sides with metal oxides is also very effective in resisting vapor transmission.

It is also possible to so construct walls that the vapor could pass outward through sheathing and sheathing paper and escape through openings in the outside wall covering or be carried away by ventilating the space between the sheathing and outside finish. Standard construction does not lend itself to this method of moisture elimination. One possible method for wood siding would be to place 1 by 2-inch furring strips over the sheathing, thus obtaining a vertical ventilating space of approximately

¾-inch which should be open to the outside at both the bottom and top of the wall, so that air could enter at the bottom and pass out at the top. The openings could be concealed behind but not covered by mouldings or other treatment at the water table and cornice. Similar ventilation could be adapted to stucco, brick, and stone exteriors. With this method the sheathing paper should be of a type that passes water vapor readily, such as slaters' felt. During periods of protracted cold weather it is quite possible that moisture would accumulate in the wall faster than it could pass through and be removed by ventilation, hence the ventilation method might not assure complete protection. So far, the possibilities in this method have not been thoroughly investigated by the Forest Products Laboratory, though tests are under way.

Insulation in Old Houses

The practice of installing insulation in existing houses, some of which have been built for many years, is becoming general, adding to both the summer and the winter comfort of the occupants. The occurrence of moisture or condensation in these older houses after insulation is uncommon, largely because such houses are not so tight as new houses, windows fit less snugly, and probably have no weather strips. Under such conditions the normal indoor humidity is low. Occasionally, however, these older homes will also show evidence of moisture accumulation, and generally when the occupant has made an effort to increase the humidity above normal. Some of the companies that insulate existing houses take off a portion of the outer wall covering and cut a large number of openings in the sheathing through which the insulation is blown. The outer covering is replaced without filling the holes in the sheathing. These openings allow more or less ventilation, and are perhaps helpful in allowing vapor to escape outward. Some companies include some form of attic or roof ventilation as a part of their contract.

Positive protection for existing buildings that have a moisture problem or where it is proposed to install winter air conditioning may require some type of barrier on the interior face of exterior walls and on the ceilings below the roof. Ordinary paints of the flat wall, or lead and oil types do not seem to offer the resistance desired, but two coats of aluminum paint, particularly on smooth plaster, appear to offer reasonably good resistance and permit almost any subsequent method of decoration desired.

The conditions that cause condensation in side walls also occur in attics or under roofs, modified more or less by any ventilation that may be provided or that may occur naturally. Roof condensation is observed or reported far more frequently than side wall condensation, since it is more in evidence. For example, in a pitched roof house condensation may develop on the roof sheathing during a severe cold spell, forming as frost or ice. During subsequent mild weather, or under a bright sun, the ice melts and water works back through the plaster and spots the ceiling.

The principles that apply to side wall protection also apply to attics, modified somewhat by the type of roof. In new construction it is easy to apply vapor barriers the same as for walls. However, many kinds of roof materials are highly vapor resistant, and any vapor passing through the barrier, or otherwise reaching the space below the roof cannot escape readily through the roof covering. With pitched roofs, ventilation through louvered openings, windows, or other means will usually take care of the situation. With flat roofs and hip roofs, and where the ceilings are bisected by roof rafters it is often difficult to provide adequate ventilation. Unless ventilation can be provided for such types of construction it is not safe to carry high winter humidities.

The question sometimes arises as to the possibility of summer cooling causing condensation in walls. This is very unlikely because the inside temperatures are seldom more than 15 degrees below outside temperatures so that the possibility of condensation would only occur during periods of extremely high humidity outside. Such a condition would be of rather short duration and would be unimportant.

General Recommendations

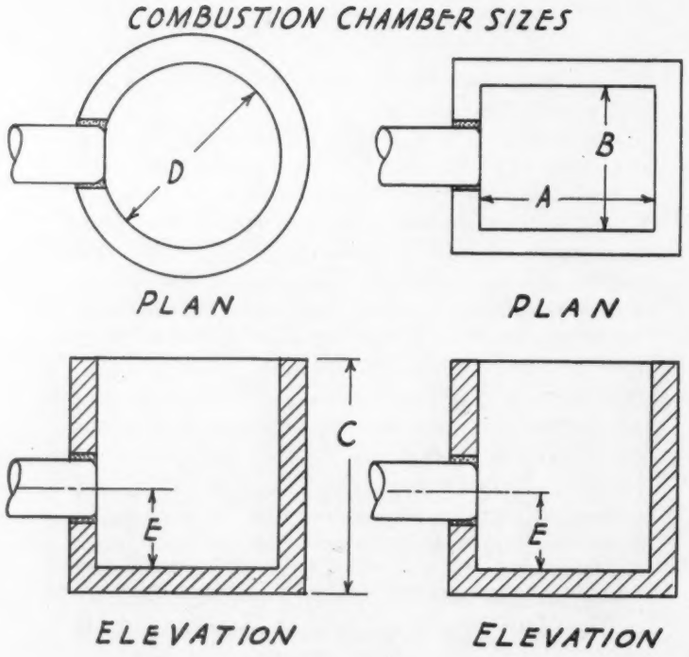
For all new houses, especially north of the Ohio River, it is recommended that a suitable vapor barrier be installed on the interior of all exposed walls, and in the ceiling below the attic, and that some form of attic ventilation also be provided. Further, that any sheathing paper used should be water resistant but permeable to vapor. The protection afforded will also prevent condensation that might otherwise develop during the construction period, particularly if the house is plastered during cold weather.

For existing houses having no vapor barriers maintain humidities at such a point that condensation will not develop in walls and attics. Since conditions in walls cannot be readily determined, the attic if tight and without ventilation, may be used for observation. In general, the safe humidity inside in relation to outside temperature will correspond roughly with the values given on Fig. 1. To maintain higher humidities safely some form of vapor barrier can be applied to the exposed walls and ceilings, such as 2 coats of aluminum paint. While not offering as much resistance as the more effective barrier this method should mean that humidities of about 30 per cent could be maintained in normal winter weather having short periods of zero weather.

The suggestions offered are based upon tests made at the Forest Products Laboratory, part of which are still under way, combined with observation and experience in occupied houses. As further information becomes available additional recommendations and modifications of the present ones will be released.

Essential Requirements For a Proper Oil Burner Installation

By J. B. Wallis
Engineering Department
The Meyer Furnace Co.



DIMENSIONS (inches)

Oil Rate	A	B	C	D	E
1.50	14	11	18	14	5½
2.00	15	13	18	16	6
2.50	17	14	18	18	6½
3.00	18	16	18	20	7
3.50	20	17	18	21	7
4.00	22	17	18	22	7½

Note: Variation in shape will be found necessary in some cases, but a corresponding floor area should be adhered to as closely as possible.

Combustion chamber shape and dimensions for proper burning of oil are shown here. The text explains why these dimensions are critical and must be adhered to.

AN oil burner properly installed is not likely to require much service other than occasional oiling of the burner motor, but an oil burner improperly installed can cause no end of grief to both owner and dealer. The following article covers all the essential requirements for a proper oil burner installation.

An oil burner should never be installed without first making a complete survey of the heating system.

(1) Inspect the chimney. A draft of .06 in. water gauge should be available in mild weather, this being reduced, by means of a draft stabilizer installed in the smoke pipe as near the furnace as possible, to about .02 in. water gauge over the fire, as determined by the use of a draft gauge. If the chimney draft is insufficient, it may be due to a loosely fitted smoke pipe or clean-out door, obstructions in the chimney, other appliances connected to the chimney, chimney too low, etc.

(2) Inspect the furnace. The furnace should be thoroughly inspected for leaks between joints and collar connections. If the furnace is not gas tight the odor of oil will escape into the house. If the furnace is in need of cleaning, this should be done before the installation is made.

(3) Warm and cold air pipes should be checked to determine whether or not they are properly proportioned.

Any defects found in the heating system should be called to the owner's attention and proper repairs recommended. This is very important because a great many good installations have proved unsatisfactory only because the owner was not notified of some defect in the heating system that would prevent satisfactory operation.

The location of the thermostat, controls, switches, oil tanks, fill line, vent line, feed line, etc., should be determined and a list of all material necessary made. In locating the oil tanks, keep in mind that they should be placed where they will occupy the least useful room and still be close enough to the fill line to be practical. Outside tanks should be located as near the burner as possible to reduce the lengths of the suction line.

When burners are installed during the heating season, when heat can be cut off for only a few hours, the following procedure has been found to be most satisfactory:

1. Set tanks and run all pipe lines.
2. Have tanks filled.

3. Put out fire as much as possible and drop coals into ash pit.
4. Mount thermostat and connect secondary wire.
5. Remove ashes from furnace.
6. Remove furnace grates, grate lugs, etc.
7. Build combustion chamber.
8. Set burner.
9. Connect piping to burner.
10. Complete all electric wiring.
11. Start burner and make all adjustments on burner and controls.
12. Test complete installation.
13. Clean up.

Proper Tank Installation

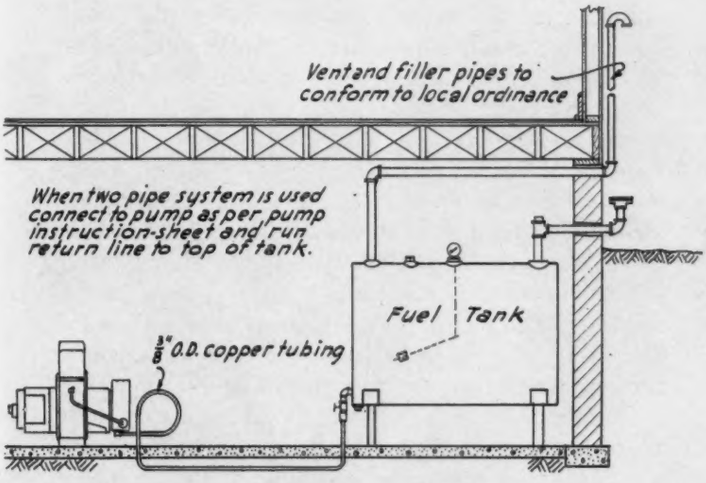
The oil storage tanks should meet the specifications recommended by the Underwriters' Labratories, but local rules and regulations must be adhered to regarding tank and burner installation. When the tank is buried, the pipe connections to it should be made with double swing joints to prevent the pipes from breaking in case the tank should settle. All pipe work and fittings must be made absolutely air tight and only the highest grade material must be used. Extreme care must be taken in cutting all pipe threads and all connections must be carefully made, using a good grade of oil and acid resisting pipe thread cement. Any material which hardens such as shellac or litharge will break its seal with a slight movement of the pipe and for this reason is unsatisfactory. Pipe lines should be placed where they are out of the way, and, whenever possible, they should be placed beneath the basement floor.

The line from the tank to the burner should not be smaller than ⅜-inch iron pipe, or ⅜-inch O.D. copper tubing. When pipes are placed beneath the floor, copper tubing should be used to eliminate joints and the possibility of leaks. When a return line is used it should be the same size as the suction line or larger. Whenever the bottom of the tank is above the pump on the burner, the oil may be fed to the burner by gravity providing local ordinances do not prohibit this method. When the burner is fed by gravity, no return line is necessary. However, if a return line is used it eliminates the necessity of priming the burner, as any air in the line is pumped back to the tank. In a gravity feed system a shut-off valve should be placed in the line near the tank so in case of leaks the supply may be shut off.

When the bottom of the tank is lower than the burner pump, or where the gravity feed system is not permitted, the supply line should be taken from the top of the tank and the return line should lead to the top of the tank on the opposite end. Unless the oil is fed to the burner by gravity, a return line must be used. The supply line should extend down into the tank within 3 inches of the bottom. A high grade foot valve should always be placed at the lower end of this line. Unless the foot valve can be easily removed for cleaning, it is advisable to remove the strainer.

In order to prevent the oil from running into the basement in case of line breakage, the suction line should be equipped with an approved anti-syphoning device.

All tanks must be equipped with a vent pipe at least 1 inch in diameter. Vent pipes must be installed so the lower end of the pipe extends less than 1 inch through the top of the tank and the outer end of the vent pipe must terminate outside the building and be equipped with a weather-proof hood screened to prevent any obstruction. All tanks should be equipped with a test well or gauging device. In no case use a glass gauge. The filling pipe of the tank must terminate outside the building and should be as remote from doors and windows as possible. This pipe should be at least 2 inches in diameter.


Vent and filler pipes to conform to local ordinance
When two pipe system is used connect to pump as per pump instruction-sheet and run return line to top of tank.
Fuel Tank
⅜" O.D. copper tubing

PIPING DIAGRAM FOR INSIDE TANK

Local ordinances control largely tank installation requirements. Here is a propr inside installation. See text for explanation.

Combustion Chamber Size

The design of a combustion chamber should be based on the following principles:

(1) The size of the combustion chamber should be based on approximately 100 sq. in. of floor area per gallon of oil burned.

(2) Combustion chamber should be rectangular with a ratio of 4 to 5 between length and width, (length based on distance between end of draft pipe and target wall), or the combustion chamber should be circular.

(3) The travel of the hot products of combustion should be as long as possible before they enter the smoke stack.

(4) As much heat absorbing surface as possible should be exposed to the radiant heat of the flame.

The combustion chamber should be made of the best grade of fire brick. A good high-temperature cement should always be used. The joints between the bricks should be not more than ⅛ of an inch. Do not use fire clay. Never spread a thin layer of cement over the face of the brick. In building the combustion chamber, the opening for the draft pipe should be 1½ inches to 2 inches larger than the draft pipe. This hole should be located so the burner nozzle is at least 5½ inches above the floor of the combustion chamber.

The combustion chamber should be constructed of brick at least 2 inches in thickness. The space between the combustion chamber and the furnace drum should be filled with a good heat resisting insulating material. Do not use sand, ashes, etc. This insulating material should be filled in level with the top of the combustion chamber. The combustion chamber should be about 16 inches in height.

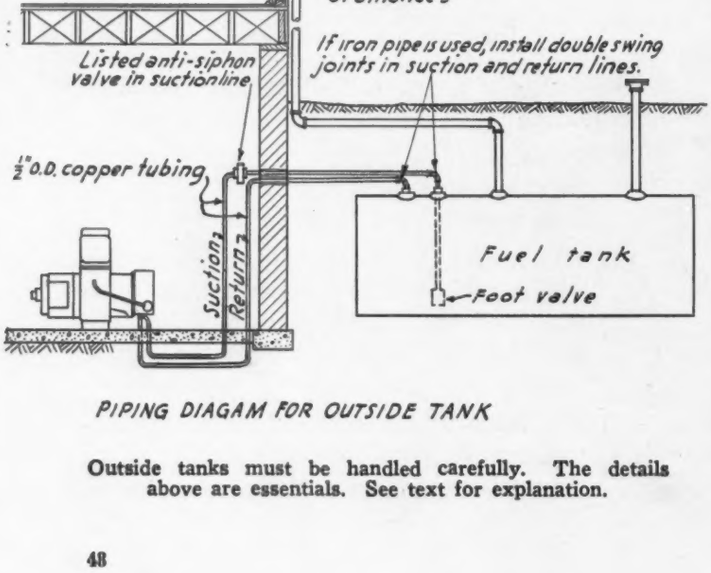
In case the outlet for the products of combustion from the combustion chamber is on the same side of the furnace as the target wall of the combustion chamber, it is advisable to place a corbel on top of the target wall extending about 2 inches over the combustion chamber, to direct the gases back toward the front of the furnace before entering the outlet.

Proper Burner Installation

The burner should be installed so the end of the blast tube is flush with inside wall of the combustion chamber. Plastic insulating material should be used to seal between the opening in the combustion chamber and the burner blast tube. Great care should be taken that no cement or insulating material is left within the burner blast tube or on the nozzle, as this will cause a crooked flame. A round piece of cardboard cut to the size of the opening in the end of the blast tube and placed therein temporarily will prevent any cement from becoming lodged on the air veins. The burner should be set so the blast tube is level or sloping slightly toward the furnace. If a drain hole is provided in the end of the blast tube, this should be opened up so that any oil which might drip in the tube can drain into the combustion chamber.

Piping connections to the burner should be made in accordance with the instructions furnished by the burner manufacturer.

All wiring must be done as prescribed by the National Electrical Code and must pass all local inspections. All wires carrying 25 volts or more must be protected by metal conduits of approved manufacture. All splices must be soldered and taped with rubber tape protected by friction tape and made in junction boxes provided for that purpose.


Vent and filler pipes to conform to local ordinances
If iron pipe is used, install double swing joints in suction and return lines.
Listed anti-siphon valve in suction line
½" O.D. copper tubing
Suction
Return
Fuel tank
Foot valve

PIPING DIAGAM FOR OUTSIDE TANK

Outside tanks must be handled carefully. The details above are essentials. See text for explanation.

Adjusting the Installation

After the foregoing has been completed, the burner is ready for the final adjustments. The best method of adjusting the burner is to throw out the fused disconnect switch and turn the thermostat up high enough so you know it is calling for heat. Then you can start and stop the burner at will by means of the switch.

Before starting the burner, adjust the air so it is about ½ open. Now throw in the disconnect switch. In case a one-pipe system is used, the air must be purged from the line in accordance with the pump instruction sheet. After all the air is purged from the line the burner should start. If too much time elapses between the time the burner motor starts and the flame starts, the stack control will shut the burner off. This control must then be reset after time has been allowed for the control to cool off—about 3 or 4 minutes.

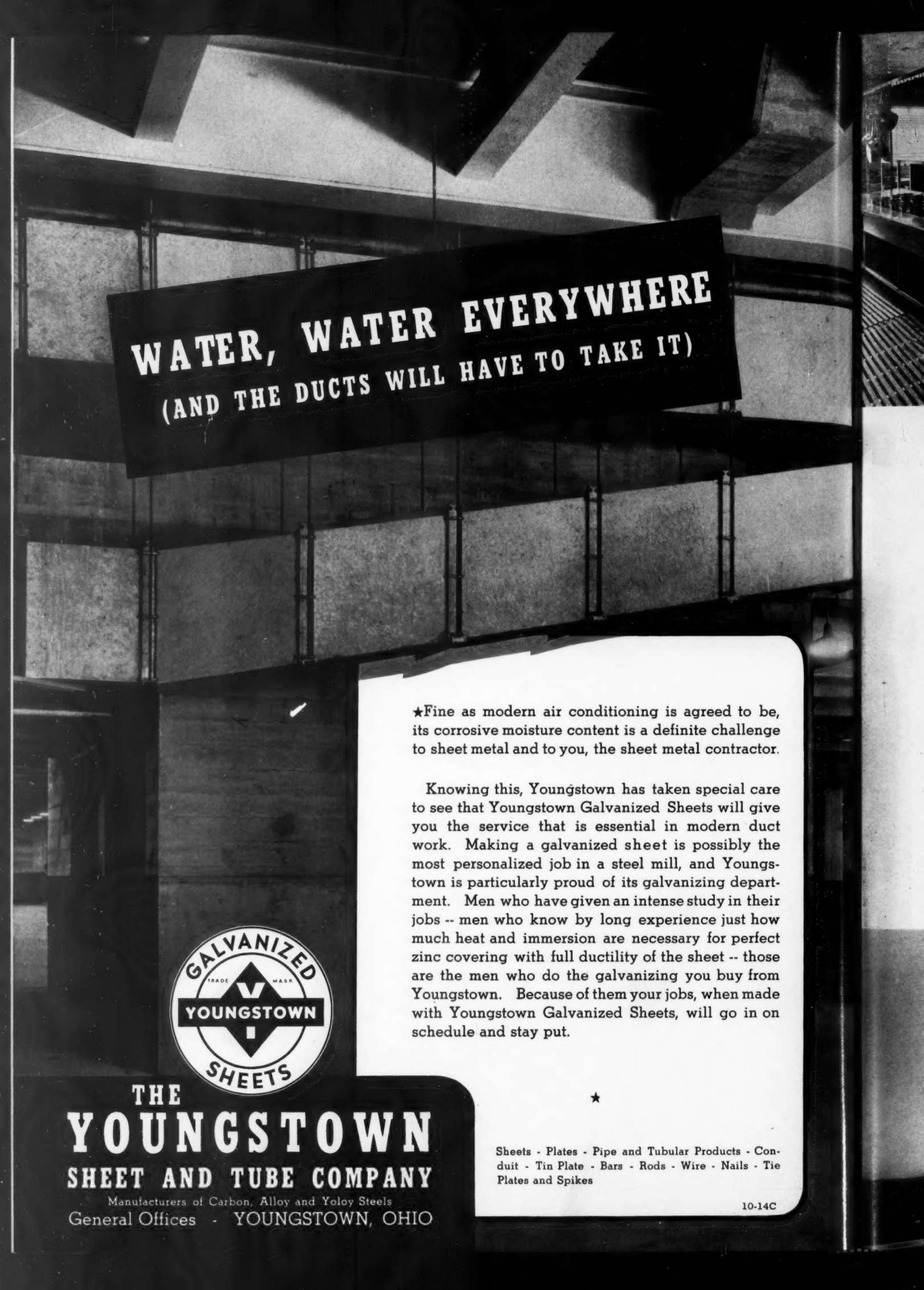
After the burner has started, the secondary air should be adjusted so there is just a slight trace of smoke at the tips of the flame. The air adjustment is about the only adjustment necessary on a high-pressure burner. The pressure is usually set at 100 lbs. per sq. in. when the burner leaves the factory and should not require changing.

The draft adjustor should now be adjusted so there is about .02 inches water gauge draft over the flame with the burner running, as determined by use of a draft gauge. After the burner has operated for about 10 or 15 minutes with the furnace door closed, open the door and inspect the

(*Continued on page* 112)

SHEET METAL SECTION

DEVOTED TO SHEET METAL CONTRACTING AND FABRICATING



★Fine as modern air conditioning is agreed to be, its corrosive moisture content is a definite challenge to sheet metal and to you, the sheet metal contractor.

Knowing this, Youngstown has taken special care to see that Youngstown Galvanized Sheets will give you the service that is essential in modern duct work. Making a galvanized sheet is possibly the most personalized job in a steel mill, and Youngstown is particularly proud of its galvanizing department. Men who have given an intense study in their jobs -- men who know by long experience just how much heat and immersion are necessary for perfect zinc covering with full ductility of the sheet -- those are the men who do the galvanizing you buy from Youngstown. Because of them your jobs, when made with Youngstown Galvanized Sheets, will go in on schedule and stay put.

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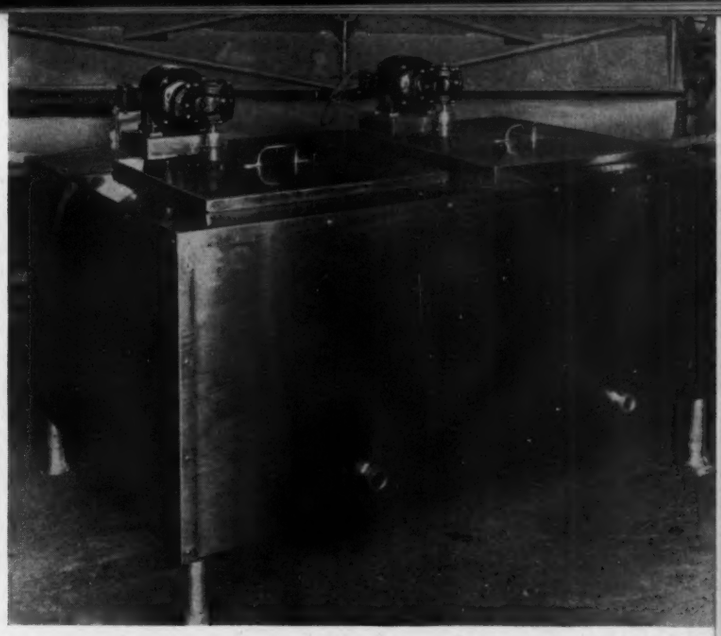
Sheets - Plates - Pipe and Tubular Products - Conduit - Tin Plate - Bars - Rods - Wire - Nails - Tie Plates and Spikes

10-14C

Stainless steel serving counter, coffee table and sink, bread rack and other items in the Officers Club, Fort Sam Houston, fabricated by Dean Specialty Works.



Holdover and mixing tank for San Antonio creamery made with stainless steel exterior panels, stainless steel inside liner (rounded corners for easy cleaning), stainless steel framing and cork insulation.

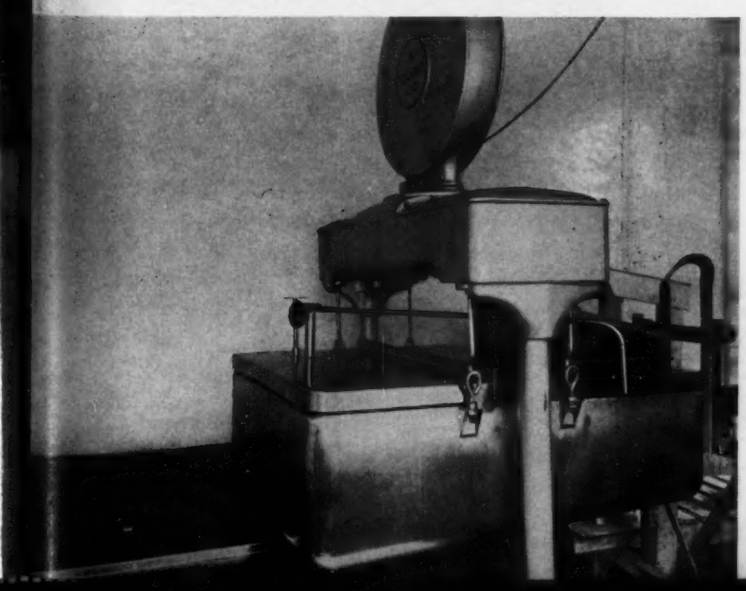
SPECIALTIES—*Mostly in Stainless Steel*

By Dean Specialty Works, San Antonio

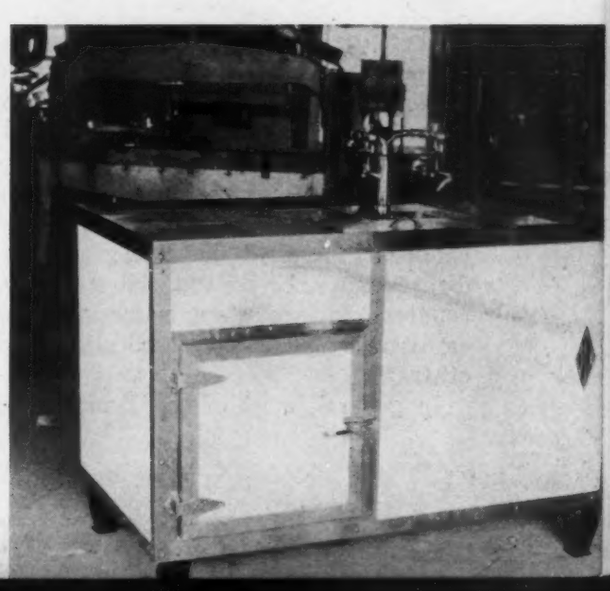
THE popularity of stainless steel in San Antonio, Texas, as a material for working surfaces, trim or ornamentation received impetus about 1938 when Thomas Dean, who operates the Dean Specialty Works, perfected his equipment and methods to electric weld, grind and polish this durable and favored material. Prior to that time, much San Antonio stainless steel was assembled by mechanical locking, soldering and stripping the soldered seams. These unsatisfactory methods naturally limited the application of stainless steel and deprived the material of one of its strongest sales features.

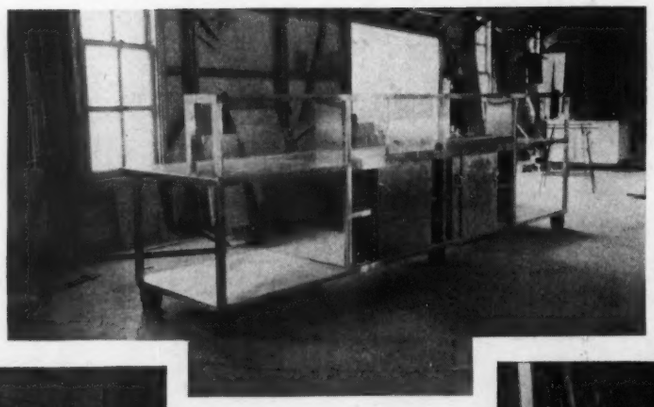
The application of welding, grinding and polishing quite naturally developed in the Dean shop. Thomas Dean entered the sheet metal trade with his father; their shop doing customary architectural metal work and some specialty fabrication, but in 1931 Thomas Dean took over the business on the death of his father and determined to develop specialty manufacturing since there was then a growing demand for all types of sheet metal products in light and heavy gauge materials. Immediately Thomas Dean found that all kinds of establishments wanted stainless steel, but hesitated in its purchase because it was difficult

Below—Weighing and receiving tanks of stainless steel fabricated to special specifications. Note rounded edges and corners formed, welded, ground and polished by Dean Specialty Works.

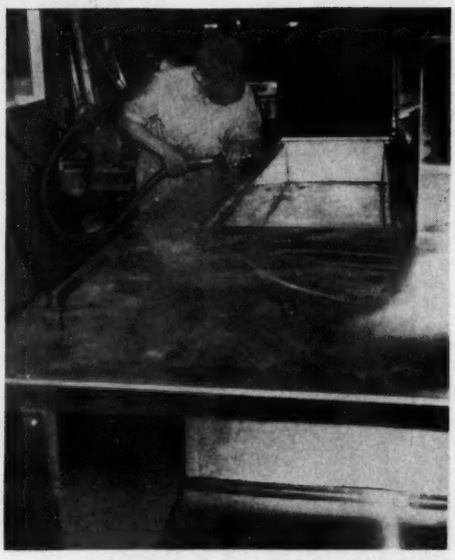


Beverage dispenser made with stainless steel frame and enameled panels. Top, including wells, surfaces, sliding covers, of stainless steel.





Left—Welding frame for a typical cabinet (electric arc). Above—Frame assembled and working surfaces ready for grinding and polishing. Exterior stainless steel panels yet to be applied. Right—Grinding and polishing wheels on flexible shafts are used to finish stainless steel. Joints are always welded.



to obtain the type of workmanship or a shop equipped to handle light to heavy material.

Having developed equipment and technique, Dean Specialty Works began looking for items to fabricate and users for the items. The variety of items which have been fabricated and the variety of purchasers makes an imposing tabulation. Restaurant and kitchen equipment, dairy equipment, school cafeteria equipment, school laboratory furniture and an endless list of items for nearby army posts, schools, and camps have kept the shop busy.

Fabricates for Many Industries

These general fields using specialty items break down into a wide variety of specialty pieces. For the dairy industry, as an example, Dean has fabricated in stainless steel receiving tanks, weighing tanks, working surfaces of all kinds, vats, etc.; for restaurants—sinks of all types, work tables, drain boards, steam tables, bakers tables, cabinets; for food dispensing establishments—dish cabinets, bread and roll warming cabinets, counters, back-counters, coffee urn hoods, pastry cases; army posts have used all these items and others.

In general, most of the Dean specialty items follow certain well established and proved fabricating ideas. Angle iron framing is preferred because such framing is easy to fabricate, is substantial, can be handled readily with Dean equipment and lends itself to welding. Legs, as the pictures show, are either pipe or special ball or block feet bolted to the framing. Where stainless steel is the covering material, such legs or feet are customarily stainless steel or chromium plated castings. Dean has made quite a feature of his concealed bolt trim, but will, when price is important, let the bolts show.

"Made to Order" Is Featured

Much of the equipment fabricated is specified to special dimensions. The customer usually has a room and wants certain pieces of equipment installed. This means that items standing free must be of certain sizes, while items against walls must fit certain wall spaces. Few pieces are of standard construction. Dean Specialty Works has made a profitable sales feature of this "special dimensioned" production.

Much of the production is in satin or Number 7 finish stainless. Linings and sub-assemblies are made of galvanized iron, copper, or other materials. Frequently trim or ornamentation is made

up of contrasting materials, enameled steel, composition sheets, even wood. In addition to grinding and buffing to eliminate all signs of welds, Dean has worked out grinding and polishing procedure to match sheet finish or to pattern the finish for ornamentation. For the customer who does not know exactly what he wants, samples are furnished and ideas worked up—a strong sales feature.

Shop equipment includes some power machinery as well as bench and foot machines and, for stainless, portable grinding and buffing wheels on flexible shafts. This equipment will handle stainless steel as heavy as 14 gauge and black iron to 12 gauge.

Word of Mouth Advertising

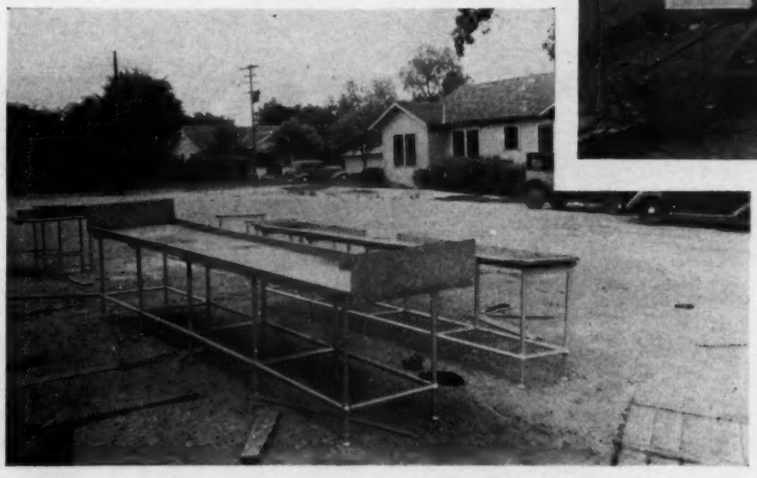
The firm's reputation for producing highly satisfactory specialty items, well constructed, in any variation of size, utility or finish has built up an expanding satisfied customer clientele. Repeat business for old customers is actively fostered. For example, a few items for an individual school has given the shop the opportunity to figure many more school jobs. A few items for one army post building has grown into scores of installations in all army posts near by and shipments to Panama and Hawaii.

Business firms using Dean equipment have made the firm's reputation known to architects and home owners so, today, quite a volume of residence sinks, work surfaces, cabinets, and other items sized to room dimensions go through the shop. Firms outside the regular field served have brought in beverage cabinets, bottle cooler cabinets, and similar items.

Dean Specialty Works purchased the cabinets above from a manufacturer, but fabricated and applied the special stainless steel sink tops and shelves. This installation is in a San Antonio hospital nurses' training diet kitchen.

Word-of-mouth advertising has been mainly depended upon for advertising. Classified telephone book advertisement is used, but newspaper advertisements, direct mail and printed literature has not been necesary. In 1938, Dean Specialty Works moved into a building erected to their specifications, a modern front building with an excellent showroom and office where typical specialty work is displayed.

Below—Inexpensive kitchen equipment made with galvanized sheets on simple pipe frame. Such items are usually made to special dimensions to fit the items to wall or floor spaces.



Above—Dish tables to be connected to dish washing machines. Same construction as equipment at the left.

Left—Details of a front entrance double canopy, with copper gutter and downspouts. All these canopies are identical, making fabrication easy. Each canopy was erected from individual pieces. Below—Air view of the project.

◆

Copper Work On a Housing Project

IN the $4,500,000 low-cost housing project recently completed in Syracuse, N. Y., sheet metal contractor Joseph Cashier and Co. fabricated and installed some 60,000 pounds of copper. The material was used for coping caps, entranceway canopies, gutters, conductors, as shown in the photographs.

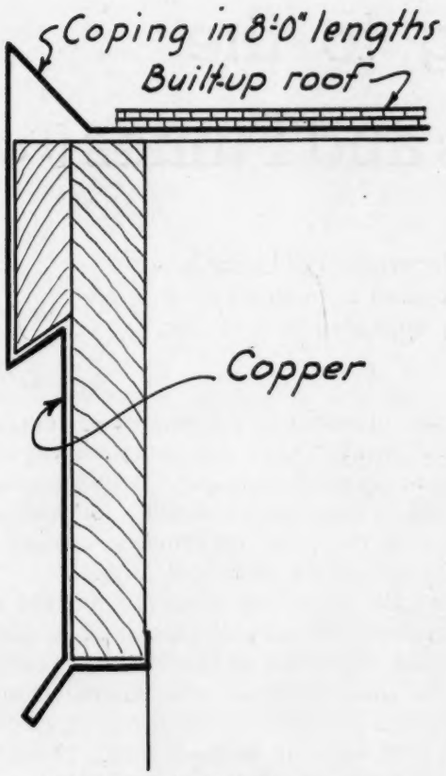
The project is interesting because a few items are duplicated hundreds of times, making possible the fabrication of pieces in large quantities and set procedure in erection.

The formation of the coping cap is shown in a detail. Pieces were fabricated in 8-foot lengths and pieces were joined by single locks. The back edge of the piece is nailed under the built-up roofing. As the detail shows, this coping cap is a combination gravel stop, cornice facing and drip and there is no gutter along the outside edge of the roof.

Some 2,500 feet of gutter and 2,500 feet of conductor pipe were required for the entrance canopies. The gutters are half round with rolled front edge. The conductor pipe is rectangular and corrugated. Both gutter and conductor pipe was purchased already formed, leaving to the contractor the cutting for length and assembly.

Over the front entrances there are double-doorway canopies as shown in one photograph. Over rear entrances there are single doorway canopies, also shown. On part of the project gutters are used for both front and rear canopies; on another group of buildings there are no gutters on the rear canopies.

In all there are about 455 canopies of one size



Above—Detail showing construction of coping cap formed in 8-foot lengths.

Blow—Single, small canopies over rear entrances; no gutters or downspouts. In all, some 455 canopies of the two sizes were fabricated and installed by contractor Cashier.

or another. However, all double-door canopies are identical and all single-door canopies are identical. This made it possible for contractor Cashier to lay out a typical canopy and make hundreds of identical pieces. The photographs show plainly the type of pieces required.

Canopies were not put together in the shop ready for erection—only pieces were formed and flanged and the canopy assembled in place on the job. As shown, standing seams were used. The flashing into the wall was installed as the brickwork went up and was later bent to the canopy. These flashing pieces stand 9 inches and are embedded 5" in the brick joint.

The standing seam of the canopy is free along the seam, but is soldered at the butt and at the edge mitre.

Since the canopies were made in pieces, the erection procedure was to cover each canopy as framed without regard for the rest of the building. In most instances the gutter was hung and the conductor pipe connected with the canopy.

Material for the work was bought in sheet, roll and strip to save as much cutting as possible.

This low-cost housing project was erected under the supervision of the Syracuse Housing Authority and the U. S. Housing Authority. Architects were M. L. and H. A. King, Syracuse, and Randall and Vedder, Syracuse. Professor L. G. Dillenback of Syracuse University was associate advisor. Syracuse Supply Co. furnished all the Revere copper used.

Rules Relating to the Removal of Dust, Gases and Fumes [Part 2]

This is a reprint of the New York State Department of Labor bulletin from which many other codes are copied or to which other codes refer. Part I of the reprinting appeared in October.

Cyclone Separators

RULE 731. Where practicable, cyclone separators shall be located outside of the building.

Every cyclone separator shall be made of steel not less than No. 22 U. S. standard gauge. Suitable means shall be provided for access to the body of the separator for the purpose of cleaning same. The refuse discharge pipe from cyclone separators shall be not less than forty-five (45) degrees from the horizontal.

Cyclone separators shall be substantially supported by rigid framework and, where necessary, protected against wind pressure by means of wire guy ropes not less than $\frac{5}{16}$" diameter.

Recommendations.—Separators should be so proportioned and constructed that they will not create more than one velocity head back pressure, to be determined by test in the discharge pipe not more than three (3) feet from the automatic damper or entrance tee in the separator. Safe means for making such tests should be provided.

Separators should be proportioned to suit conditions; light dusts requiring larger separators.

The area of the inlet pipe to a cyclone separator should be at least equal to the area of the discharge pipe from the fan.

For light dusts, the air outlet from the top of the cyclone separator should be sufficiently large so that the velocity of the discharged air will not exceed 300 to 460 feet per minute.

The air outlet should be provided with a proper canopy to exclude the weather, but should otherwise be unobstructed.

There should be ample clearance under the separator for a refuse receptable large enough to accommodate an accumulation of refuse.

Rules for Grinding, Polishing and Buffing Wheels, Straps and Belts

RULE 733. Every grinding, polishing or buffing wheel, strap or belt or automatic machine, except such wheels as are used in the manufacture of articles of gold or platinum and those used occasionally for grinding tools used in the shop, shall be connected to an exhaust system, including a separator, that will carry off the dust or refuse at its point of origin. An exhaust system shall not be required for wheels upon which water is used at the point of grinding contact unless dust is thrown off from such wheels.

When the top of the wheel runs toward the operator, the main suction pipe shall be back and below the wheel and as close to it as practicable.

RULE 734. Sufficient static suction shall be maintained in every branch pipe to produce a difference of level of at least two (2) inches of water between the two sides of a U-shaped test tube.

RULE 735. Every hood shall be so constructed as to expose the smallest portion of the wheel consistent with efficient operation, and its free edges shall be turned back or faced to prevent injury to the hands of workmen.

RULE 736. Exhaust hoods used for the protection of grinding wheels shall be constructed according to the rules for guarding dangerous machinery.

NOTE.—For construction of exhaust system, see general rules.

Recommendation.—Where there is likelihood that the hood may scratch the work, the edges of the hood should be covered with leather or other suitable covering.

RULE 737. The minimum sizes of the branch pipes for different sized grinding and polishing wheels (polishing wheels for the purposes of this Code shall be considered to be "made-up" hard wheels faced with an abrasive) shall be as follows throughout their entire length:

DIAMETER OF WHEEL	MAXIMUM WHEEL SURFACE (SQ. IN.)	MINIMUM DIAMETER OF BRANCH PIPE (IN.)
6" or less not over 1" thick	19	3
Over 6" to 9" incl., not over 1½" thick	43	3½
Over 9" to 16" incl., not over 2" thick	101	4
Over 16" to 19" incl., not over 3" thick	180	4½
Over 19" to 24" incl., not over 4" thick	302	5
Over 24" to 30" incl., not over 5" thick	472	6

Where the maximum grinding surface exceeds 472 square inches a proportion of one square inch of pipe area to each fifteen square inches of grinding surface shall be provided for dust removal. Disc wheels of 24 inches or less in diameter shall be provided with branch pipes at least 4½ inches in diameter, wheels over 24 inches in diameter shall be provided with branch pipes not less than five (5) inches in diameter.

If a wheel is thicker than given in the above table, it shall have a branch pipe not smaller than is called for by its wheel surface as above specified.

RULE 738. The minimum sizes of branch pipes for different sized buffing wheels or where buffing and polishing wheels are used interchangeably shall be as follows throughout their entire length:

DIAMETER OF WHEEL	MAXIMUM WHEEL SURFACE (SQ. IN.)	MINIMUM DIAMETER OF BRANCH PIPES (IN.)
6″ or less, not over 1″ thick	19	3½
Over 6″ to 12″ incl., not over 2″ thick	75	4
Over 12″ to 16″ incl., not over 3″ thick	151	4½
Over 16″ to 20″ incl., not over 4″ thick	251	5
Over 20″ to 24″ incl., not over 5″ thick	377	5½
Over 24″ to 30″ incl., not over 6″ thick	565	6½

If a wheel is thicker than given in the above table it shall have branch pipes not smaller than is called for by its wheel surface as above specified.

Buffing wheels six (6) inches or less in diameter used for jewelry work may have a three (3) inch branch pipe.

RULE 739. In cases such as grinding, polishing and buffing of auto bumpers, propellers and other special work more than one branch pipe from the hood may be required, according to the work being done.

Similarly, on extremely wide face wheels where the amount of abraded material is comparatively small, a smaller sized branch pipe may be accepted.

Machines or Other Apparatus or Equipment Creating Dust or Fumes

RULE 740. 1. The following machines shall be connected to an exhaust system, including a separator, that will carry off the dust or refuse at its point of origin:

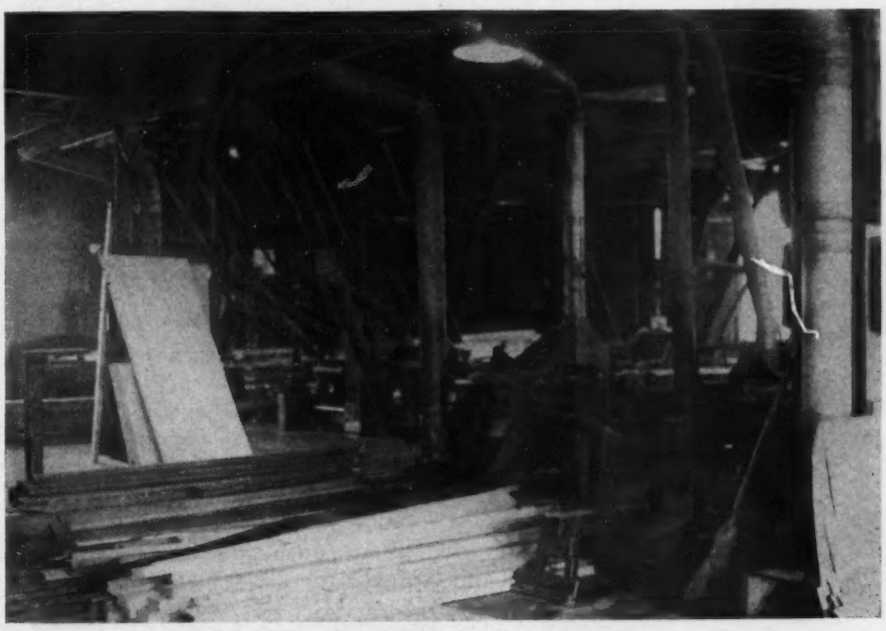
(a) Machines used for cutting, drilling, sawing, dressing or polishing stone, glass, mother-of-pearl, ivory nuts or other material of similar character.

(b) Machines used for picking, carding or garneting fibrous substances or shoddies.

2. Every receptacle or apparaus used for melting lead, zinc, antimony or metal compounds shall be connected to an exhaust system that will carry off the gases or fumes at their point of origin.

Exception: Subdivision 2 shall not apply to portable receptacles or apparatus; or to linotype, monotype or type casting machines which are equipped with electrically heated pots and in which only clean metal is melted.

RULE 741. All dust, fumes, vapors, gases, fibres, fogs, mists or other atmospheric impurities that are emitted or created in quantities tending to injure the health of employees in or in connection with any process of manufacture which involves the formation or use of substances listed below and that can be detected by a recognized



Mains, branches, hoods, valves—all must be properly designed and correctly installed if a material removal system is to operate at maximum efficiency and minimum cost. This is a typical wood-working shop installation.

standard method of chemical analysis, shall be removed by means of suction devices as far as practicable at their point of origin:

acrolein	hydrogen sulfide
acetone	lead or its compounds
acids	manganese dioxide
aldehyde	mercury or its compounds
alkalies	methyl alcohol
amyl, butyl, or ethyl acetates	nitric acid or nitrous gases
amyl alcohol	nitrotoluenes
aniline	nitro-hydroxy or amino derivatives of benzene or its homologues
arseniuretted hydrogen or other arsenical com'pds	petroleum products
benzene or its homologues	phenols
benzol	phenylhydrazine
carbon bisulfide	phosgene
carbon monovide	phosphorus or its comp'ds
carbon tetrachloride	picric acid
chloride of lime	pyridine
chlorine	silica dust
chloro-nitrobenzol	sodium hydroxide
chromium compounds	sulfur chlorides
coal tar dyes	sulfuric or sulfurous acids
cyanogen compounds	tar
dimethyl sulfate	tetrachlorethane
formaldehyde	toluene
hydrochloric acid	turpentine
hydrocyanic acid	wood dust
hydrofluoric acid	zinc or its compounds

NOTE.—This list is not necessarily complete and other items may be added at the discretion of the Industrial Board.*

*Code authority formerly exercised by the Industrial Board was transferred to The State Board of Standards and Appeals created in the Department of Labor by Chapter 819 of the Laws of 1937.

RULE 742. Every workroom in which carbon monoxide is emitted or created in or in connection with any process of manufacture shall be provided with such ventilation that the carbon monoxide shall not exceed two parts in ten thousand volumes of air in any occupied part of such workroom.

RULE 743. All gas piping and connections shall be kept free from leaks.

RULE 744. The Commissioner shall advise the owner or his authorized agent as to the amount of suction required and method of making test.

Lead Dusts and Fumes

RULE 745. Every operation or process in the manufacture or use of metallic led, white lead, red lead, litharge, sugar of lead, arsenate of lead, lead chromate, lead sulphate, lead nitrate or fluosilicate, or in the manufacture of pottery, tiles or porcelain enameled sanitary ware, including the corroding or oxidizing of lead, the crushing, mixing, sifting, grinding and packing of all lead salts or other compounds shall be so conducted, and such adequate devices provided and maintained by the employer as to protect the employee, as far as possible, from contact with lead dusts or lead fumes. Every kettle, vessel, receptacle or furnace in which lead in any form above enumerated is being melted or treated, and any place where the contents of such kettles, receptacles or furnaces are discharged, shall be provided with a hood so constructed and located that the dust or fumes will be drawn into it, and connected to an exhaust system; all vessels or containers in which dry lead in any chemical form or combination above enumerated is being conveyed from one place to another within the factory shall be equipped at the places where the same are filled or discharged with hoods connected to an exhaust system; and all hoppers, chutes, conveyors, elevators, separators, vents from separators, dumps, pulverizers, chasers, dry-pans, other apparatus for drying pulp lead, dry-pans dump and all barrel packers and cars or other receptacles into which corrosions are at the time being emptied shall be connected to an exhaust system. Such system shall have the discharge properly filtered. If a cloth screen dust arrester is used it shall have not less than ½ square foot effective area of cloth per cubic foot of dust laden air per minute passing through it. Open pipe filter shall be placed in a separate room which no employee shall be required or permitted to enter except for essential repairs while works are in operation.

RULE 746. The Commissioner shall advise the owner or his authorized agent as to the amount of suction required and the sizes of pipe necessary in exhaust systems.

RULE 747. The employer shall provide, and renew when necessary, at least two (2) respirators of approved type for each employee who is engaged in any work or process which produces lead dusts.

[Part 3 of this reprint, which will follow, covers specifications for all parts of wood working plant collecting systems. The machines are classified and include most of the machines found in modern plants. Part 3 will constitute a handy reference chart.]

Product Finishing

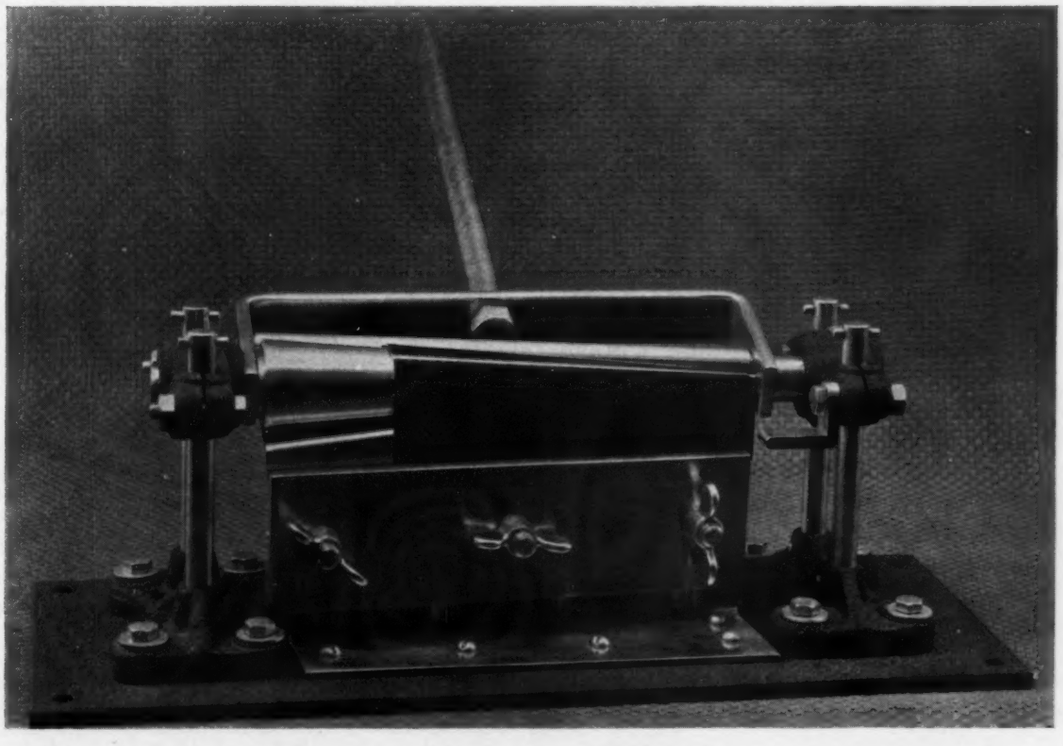
The Testing and Evaluation of Organic Finishes and Finishing Materials

By W. G. Sheane
Chemical Engineer, General Electric Co.

THE testing of lacquers, enamels, japans, varnishes, etc. may be divided into two parts, namely, tests on the finishing material itself and tests for the quality of the completed finish. In the former group there are a few tests which apply only to certain types of finishing materials. For example, the "blush" test (October issue) is of interest in testing lacquers and is not usually a part of the testing routine for all materials. The largest number of tests, however, are generally employed in one modification or another regardless of the type of finishing material under consideration. Given below are a number of these tests.

1—Curing Schedule
2—Skinning
3—Settling
4—Toxicity
5—Odor
6—Color
7—Gloss
8—Flow
9—Viscosity
10—Workability
11—Specific Gravity
12—Solids Content
13—Cost of Material
14—Cost of Reducer
15—Reduction for Application
16—Hiding Power
17—Covering Power

The tests listed above are not necessarily in order of importance.



Conical Mandrel Test Apparatus. For measuring the distensibility of organic finishes. The panel to be tested is bent over a continuous series of diameters ranging from ⅛ to 1½ inches.

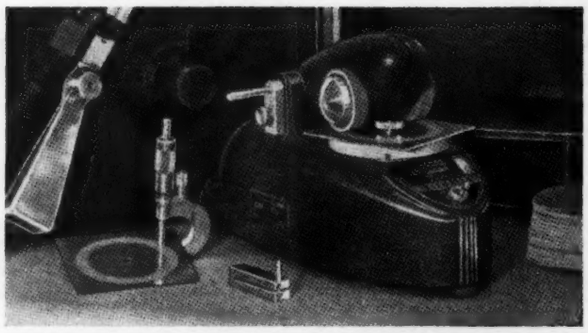
Testing the Completed Finish

There is no question that the ideal manner in which to test the quality of an organic finish is to make a field trial. Such a procedure, allowing observation of the performance of the finish under actual conditions, provides the best possible basis for appraisal. However, field trials are time consuming and the rapid advances in the technology of finishing and finishing materials and the demand for speed necessitated by keen competition in most lines will not permit waiting for results. It becomes necessary, therefore, to depend on accelerated tests—tests which intensify conditions met in actual use and, producing breakdown of the finishing in a relatively short time, permit rapid conclusions to be drawn.

In general accelerated tests fall into three classifications. These are: resistance to chemicals, to mechanical abuse, and to the elements. Given below are some of the more important individual tests. It might be said here that the tests used, the conditions of test and the sequence of tests, if any, are dependent on the conditions met in the field.

Hart Impact Tester. The resistance of an organic finish to impact is measured by the number of drops of the hammer required to produce rupture of the film.

I. Chemical resistance—
   1. Acids (inorganic)—nitric, hydrochloric, sulphuric, etc., various concentrations at various temperatures.
   2. Acids (organic)—citric, acetic, oxalic, etc., various concentrations at various temperatures.
   3. Alkalis—sodium hydroxide, sodium carbonate, etc., various concentrations at various temperatures.
   4. Water—at various temperatures.
   5. Salt Water—various concentrations at various temperatures.



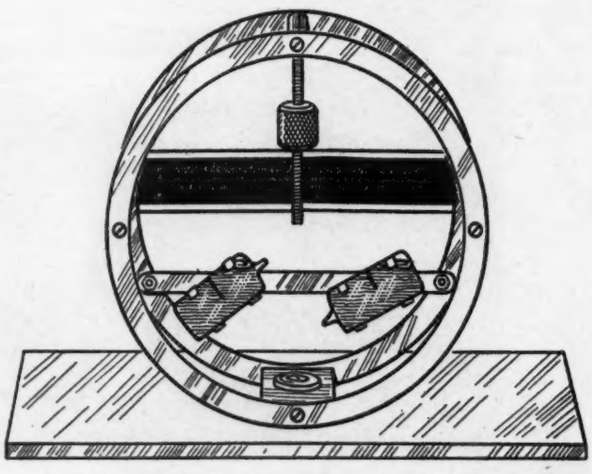
Taber Abraser. For measuring the resistance of an organic finish to abrasion. This instrument may also be used to test adhesion.

   6. Solvents—various alcohols, esters, ketones, hydro-carbons, etc. or combinations at various temperatures.
   7. Greases and Oils—various animal, vegetable, etc. at various temperatures.
   8. Gases—sulphur dioxide, chlorine, hydrogen sulphide, etc. at various concentrations at various relative humidities at various temperatures.

II. Resistance to mechanical abuse—
   1. Abrasion
   2. Adhesion
   3. Bend
   4. Print
   5. Impact

III. Resistance to elements—
   1. Humidity—various relative humidities at various temperatures.
   2. Weathering—outdoor exposure at various parts of the country.
   3. Discoloration—heat, light, ultraviolet.
   4. Heat and Cold—various sequences of various temperatures.
   5. Salt Spray—various sodium chloride solutions at various temperatures.

As in the case of tests on finishing materials,

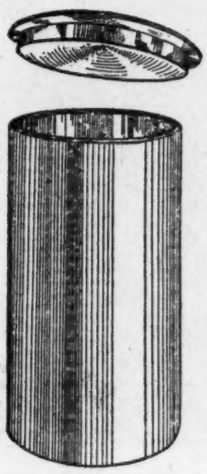


Sward Hardness Rocker. For testing the hardness of organic coatings and their drying times.

the tests listed above are not necessarily in order of importance.

Evaluation

In the final analysis, the selection of an organic finishing material is based partly on the characteristics of the material itself and partly on the properties of the completed finish. The various factors must bear such a relationship to each other that a balanced system results. For example, a material may produce a finish which exhibits excellent qualities of chemical resistance, adhesion, etc. If, however, the material is too costly, is difficult to apply, requires a large outlay for new equipment, etc., it is obvious that the system is not balanced and it is very likely that other materials would be investigated.



Weight Per Gallon Cup. A special type of pycnometer for determining the weight per gallon of finishing materials and thinners.

The procedure of evaluating a total system—material and completed finish—is as follows. The individual factors which are important are selected and each factor is assigned some value of importance relative to the others. For example, the nine factors listed below might be chosen as the important ones and given the values shown.

Factor	Importance
Cost	15
Workability	7
Settling	2
Alkalis	20
Greases	8
Adhesion	20
Abrasion	15
Humidity	5
Discoloration	8
	100

Following the choice of factors and their relative values, the finishing material or the completed finish, as the case may be, is tested for each factor and rated according to its worth. Where tests can be made strictly quantitatively, the ratings can be made numerically from zero for an extremely poor characteristic to ten for an excellent one. If, on the other hand, test results cannot be obtained from direct instrument readings and personal judgment is largely involved, ratings may be taken as ranging from very poor through excellent and each rating given a numerical value. Thus:

Rating by Test	
Excellent	10
Very Good	8
Good	6
Fair	4
Poor	2
Very Poor	0

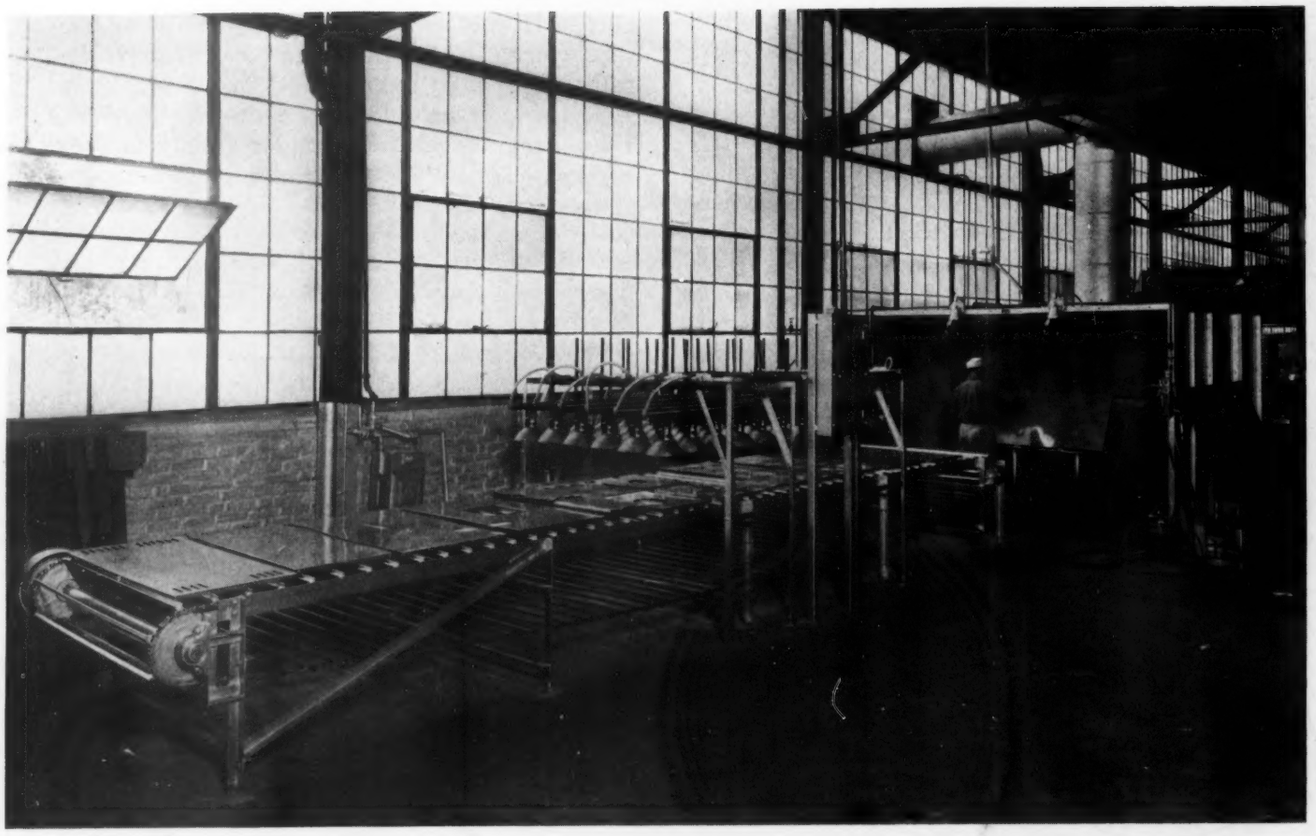
The final evaluation is obtained from the sum of the products of the importance value and the testrating of all of the factors. It is expressed in quality points. The possible perfect score, of course, would be 1000 quality points.

Zahn Cup. An efflux type viscometer for measuring and controlling the consistency of finishing materials.

A typical final evaluation data series might be as follows:

Factor	Importance		Test Rating		Quality Points
Cost	15	×	7.5	=	112.5
Workability	7	×	9.0	=	63.0
Settling	2	×	9.0	=	18.0
Alkalis	20	×	5.5	=	110.0
Greases	8	×	8.0	=	64.0
Adhesion	20	×	6.0	=	120.0
Abrasion	15	×	6.5	=	97.5
Humidity	5	×	7.0	=	35.0
Discoloration	8	×	9.0	=	72.0
			Total Quality Points	=	692.0

The success of the method for evaluation described above depends on first the proper choice of importance values and second correct interpretation of individual test results.



Infra-Red Method For Quick Drying Finishes

By T. H. Smoot
Chief Engineer, Fluid Heat Division, Anchor Post Fence Co.

ELECTRIC heat's newest progeny is the infra-red lamp for industrial drying and baking processes. It has attracted wide attention, notably in automobile manufacture, where the process originated, and it is now demonstrating its merits in Baltimore, where an installation was recently placed in service by the Fluid Heat Division of the Anchor Post Fence Company.

This company, a manufacturer of iron picket fences and oil burners, is using infra-red drying on its new air conditioning units. The problem involves the finishing of sheet metal, and ways had to be found to do the job properly at a speed required for quantity production.

The jacket panels are 20-gauge automobile body sheet steel. It was decided that the finish must be baked in order to provide a coating not easily marred and one that would not be affected by heat when in service. Investigation of gas, oil and electricity as heating mediums disclosed that each had some features to recommend it and that any of them would produce a satisfactory finish.

With ovens fired by gas or oil, however, the drying time would be about two hours and the size of the equipment to handle such an operation would create a serious problem because of the limited space available in the factory. Heating-up delays, unwieldy facilities for handling, and the cost of operating such a large, inflexible apparatus were factors that would add to manufacturing cost.

Infra-red electric lamps were investigated and it was found that space required could be cut down and that a reduction in drying time could certainly be expected. A compact infra-red outfit, therefore, was selected.

The heating section comprises ninety-six 260-Watt infra-red lamps, set 12 to a row, in gold-plated, focusing reflectors. The battery covers approximately 11 feet in a 30-foot Link-Belt conveyor, leaving a 7-foot loading space and a 12-foot cooling space. The conveyor is controlled by reducing gears and moves at a rate of speed timed to the spraying output and the requirements of the

Above—Closeup view from below looking into the reflecting bowls of the battery of infra-red lamps. On facing page—Arrangement of paint booth, conveyor, infra-red lamp battery and inspection table in Anchor Post Fence Co.

job. When the sheets reach the unloading end, they are cool enough to handle.

Having installed the infra-red dryer, lengthy experimentation with various finishes was carried out to find the one best adapted to this particular application. The one selected is a chemical product known commercially as Polymerin. The secret of its smoothness and durability is found in its reaction when exposed to the infra-red rays of the dryer. These rays penetrate the coating and heat the metal underneath. The heat dries the finish from the inside out and causes a chemical reaction which changes the molecular construction of the coating.

In the drying process the molecules become large and interlocked and firmly bond themselves to the metal underneath. The result is a smooth horn-like finish that is durable and long-lived.

With the infra-red drying set-up no preheating is necessary. Full application of heat follows the instant the lamps are turned on, and even a single sheet can be passed through the oven without wasting heat because the lamps can be turned on and off progressively as it moves under them. The actual cost of operating the oven at full capacity is very modest, and the actual drying time is less than ten minutes, which is a remarkable saving over the two hours required by other accepted baking processes.

In working with the infra-red baking treatment of chemical finishes several interesting things were discovered. One is that thickness and mass of metal have great influence over baking periods. An example is the ten minutes required for baking the sheet steel used in jackets for air conditioners up to more than double that period for our assembled oil burners. Our particular product is composed almost entirely of steel stampings, which require the additional time mentioned. Castings, however, need still a longer baking period because the metal must be brought up above 200 degrees F. in order to permit the catalytic action of the heat to change the sprayed coating into a tough, beautiful finish.

Inexpensive Solutions To Clean Sheet Metal

(From Glycerine Facts)

AMONG the practical and effective methods and materials for removing rust, forge scale and dirt from iron, steel and sheet metal presented by R. Plucker in the technical publication, "Emailwaren-Industrie," glycerine is an important constituent or adjuvant.

An inexpensive solution for removing rust is shown in Table 1.

Table 1

Sodium hydroxide	750 Gm.
Soda crystals	875 Gm.
Potassium permanganate or potassium manganate	10 Gm.
Water	12 liters

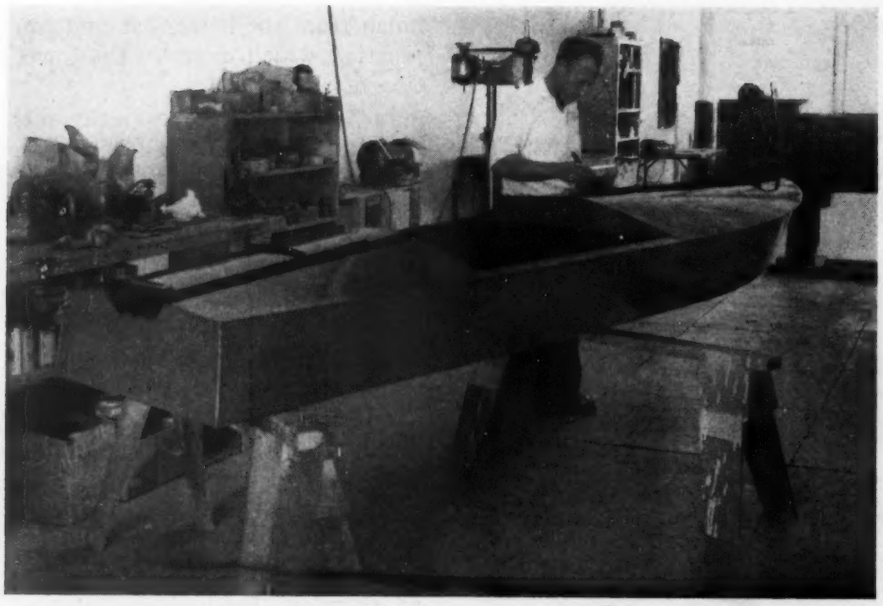
For cleaning off dirt, oil, colors and the like, the addition of a little glycerine to the solution is recommended.

Since they keep well, the mixed dry materials may be stored and added to the water just prior to use. The rust dissolves after a few minutes in the solution and can be wiped off. The metal underneath is not corroded and possesses a thin coating which protects it from rust for a short time. The glycerine addition does not affect the derusting action.

For metal cleaning alone, the glycerine-containing mixture shown in Table 2 is suggested.

Table 2

Soda crystals	4 Kg.
Sodium hydroxide	250 Gm.
Glycerine	125 Gm.
Potassium manganate	16 Gm.
Hot water	120 liters



Shop Made, Sheet Metal Duck Boat

By Jos. C. Coyle

A NEAT duck and fishing boat, for use with a 1½ hp. outboard motor, is built by Blevins Sheet Metal Shop, Yuma, Arizona. It is 10 feet 1 inch long, with 38-inch beam. It has a vee bottom and arched top and weighs approximately 90 pounds. The sides are 9½ inches and maximum depth is 18 inches at the middle. The vee bottom is reinforced by a ¾-inch double lock standing seam, and the top by single lock standing seams of the same width. Edge seams in the top are riveted. Thirty-six inches of the front is a sealed air space and there are two 7 by 10 by 32-inch air tanks at the rear, all riveted. All seams are soldered.

General Construction

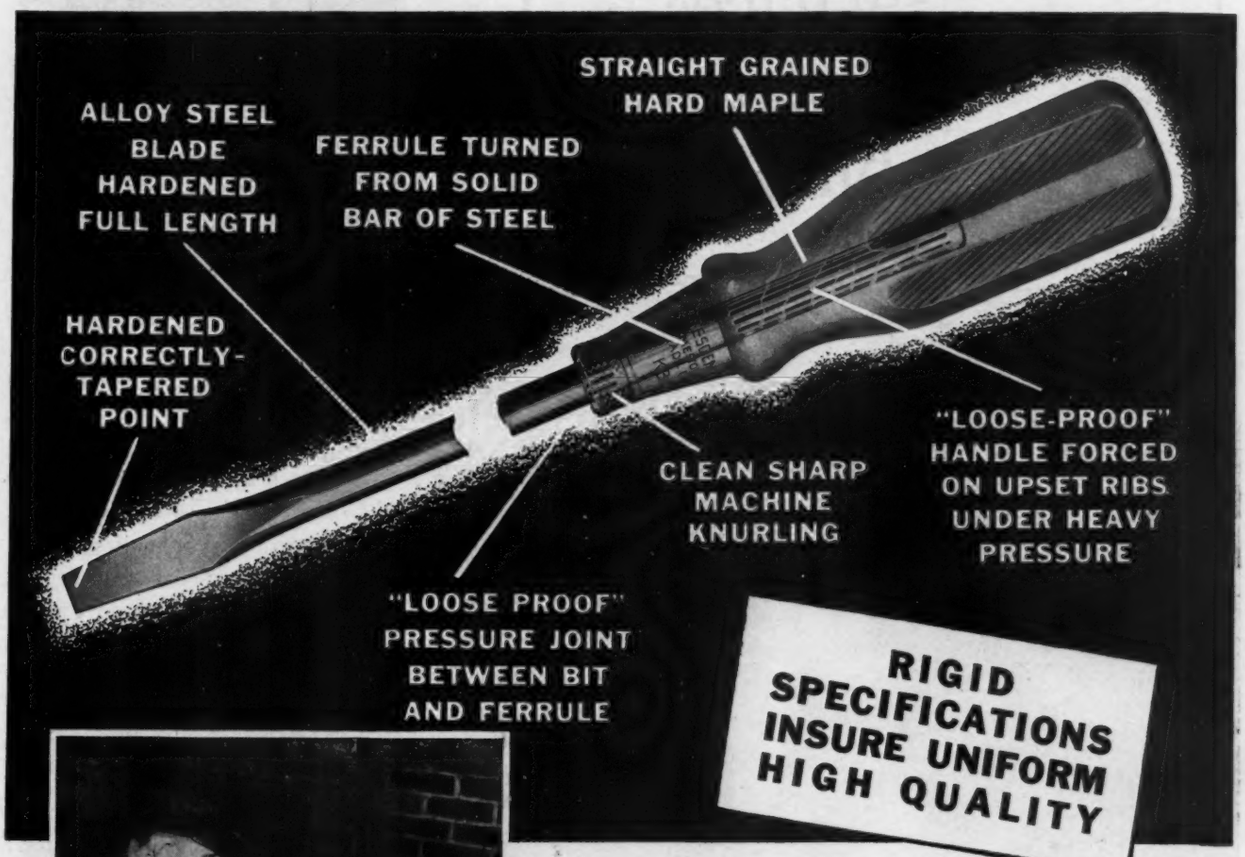
Space between and over the rear air tanks is reached through a sliding cover and is used for storage. The cover is moved slightly to install the motor, for which a 2 by 10 by 11-inch wood block is anchored in the back end. There is also a space for motor tools under the 16 by 35-inch metal seat, which is 2½ to 5 inches from the boat bottom in front. Access to this space is through two round holes in the seat which are covered with Life-saver seat pads. There is 29 inches of leg space in front of the seat. The tie ring is of ½-inch tubing.

Nearly five sheets of steel are used in one of the boats. The sections are designed and cut by hand with snips. The double lock seams are formed on a brake while curved edges are put through the edging and beading machines, and tanks swaged with a swaging machine. Rivet holes are made with both a drill press and pistol grip drill. The rivets are set with hand tools. A blow torch is used in soldering, which required 9 pounds of "half-and-half" wire solder.

Finishing Methods

In finishing, the galvanize is first removed from the metal with vinegar. The metal is then dusted off with a cloth and a metal primer applied. This dries in four hours and the surface is sanded. Each of two coats of enamel dries 12 hours before the following coat is applied and is sanded lightly with 0 paper when dry. The third and final coat dries the same length of time, is then rubbed down and then may be either waxed or polished. The boat shown here is dark red on sides and bottom, but the final coat on top is black. It was finished entirely with a hand brush.

CRESCENT SCREWDRIVERS


ALLOY STEEL BLADE HARDENED FULL LENGTH
FERRULE TURNED FROM SOLID BAR OF STEEL
STRAIGHT GRAINED HARD MAPLE
HARDENED CORRECTLY-TAPERED POINT
"LOOSE PROOF" PRESSURE JOINT BETWEEN BIT AND FERRULE
CLEAN SHARP MACHINE KNURLING
"LOOSE-PROOF" HANDLE FORCED ON UPSET RIBS UNDER HEAVY PRESSURE
RIGID SPECIFICATIONS INSURE UNIFORM HIGH QUALITY

TORSION TEST: Every individual Crescent Screwdriver blade is tested after heat-treating. The above testing machine grips the blade tip and applies a pre-determined torque load. Individual "Temper Tests" also check the full-length hardening given every Crescent blade.

The fact that screwdrivers are rather commonplace tools is, in the Crescent opinion, all the more reason for making them better. Crescent design and construction contradict the oft-expressed theory that "almost any screwdriver will do." Experienced industrial buyers who study small tool cost and performance know that theory to be unsound. That's why *Crescents* are first choice in many leading industrial plants!

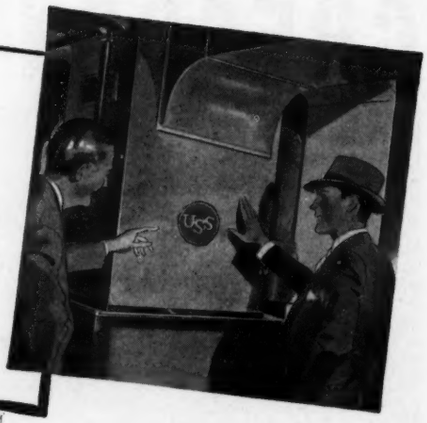
Crescent Screwdrivers are made to strict specifications. They embody the fine design features illustrated above. They are thoroughly tested during manufacture as illustrated at the left. Their superiority shows up in terms of greater safety for the worker—better work and more of it—and much longer serviceable life.

There are Crescents for every class of work—blade lengths from 1½ to 12 inches. Make these fully-guaranteed Screwdrivers *your* choice.

CRESCENT TOOL COMPANY JAMESTOWN, N. Y.

CRESCENT and Smith & Hemenway TOOLS

Can furnaces and duct work last the life of a building?



This chart compiled from inspection reports of the Committee on Corrosion of Iron and Steel, A.S.T.M. Proceedings 1937, shows results of tests carried on at Annapolis, Md. from 1916 to 1936. After 21 years' exposure, 91% of COPPER STEEL sheets remained "sound" (unperforated) Other materials were decidedly inferior.

YES—if they are built of U·S·S Galvanized Copper Steel! And surprising as it may seem, it costs less than a dollar more in the average home to build the duct work of this *longer lasting* metal. While plain galvanized steel gives good service in normal usage, for humidified air systems, the extra rust resistance of U·S·S Copper Steel is needed.

Look at the corrosion chart shown here. Various types of iron and steel commonly used for duct work were tested for 21 years in the open air. Copper Steel proved itself vastly superior. It has 2 to 3 times the rust resistance of plain steel or pure iron.

U·S·S Galvanized Copper Steel gives you *plus* selling value. Building owners immediately see the value of steel with double rust resistance—especially for damp locations.

Write for our booklet on U·S·S Copper Steel. We'll gladly send you complete information.

When duct work carries humidified air, there's always danger from rust. By building with U·S·S Galvanized Copper Steel you can provide two to three times the resistance to atmospheric corrosion.

GALVANIZED COPPER STEEL SHEETS

CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago*
COLUMBIA STEEL COMPANY, *San Francisco*
TENNESSEE COAL, IRON & RAILROAD COMPANY, *Birmingham*

Scully Steel Products Company, Chicago, *Warehouse Distributors*
United States Steel Export Company, New York

UNITED STATES STEEL

BOOKKEEPING—

A Plan of Accounts [Part 2]

By Joseph G. Dingle, C. P. A., Ottawa, Ill.

LAST month we presented a Chart of Accounts, showing the separate accounts necessary to properly analyze the business transactions of a typical Heating and Ventilating Shop. We discussed in detail the accounts in the Asset Section of the ledger. We now discuss the accounts shown in the Liability and Capital Sections of the Chart of Accounts.

We regret very much our inability to cover this entire subject in one issue, but we have so divided the discussion as to make each article complete as to the subdivision discussed. We again wish to remind you that each "account" is a separate sheet in the ledger, placed there for the specific purpose of receiving specific data or information pertaining to the purpose indicated in the account name.

We might suggest that our readers preserve their copies of the ARTISAN and before taking up a study of the current article, refer to the Chart of Accounts as it appears in the October issue. We do not believe it necessary to again print that Chart.

The Liability section of the Ledger deals with the debts owed by the business. The inter-relation of these accounts with those in the Asset Section will be quite apparent to our readers. For instance if you borrow money on a Note Payable, you will incur a liability to the bank, and in so recording that liability, you will show an increase in your asset account, bank, for a like amount. Or, perhaps, you are entering an invoice from your supply house as an account payable. This invoice is a debt you owe, and is for material you have acquired, or an increase in your asset account—Material.

51—ACCOUNTS PAYABLE—Upon the receipt of an invoice covering materials and supplies, the shop is on notice that within a short time certain goods are to be received. It should be the duty of some one person in the business organization to watch for the arrival of these goods, see that they are as billed, both as to quantity and quality and so note that fact on the invoice, or on a receiving ticket. This done, the invoice should be placed in the hands of the bookkeeper for entry upon her books. The account here under discussion is a controlling account, showing at all times the total amount owing by the business to its creditors and separate accounts will be kept to show the amount owing to each separate creditor. As payments are made on these accounts, the transaction will be to record the fact that the payment has been made and a corresponding entry will be made in the bank account or, perhaps, in Notes Payable, to be discussed next.

52—NOTES PAYABLE—This account, as its name implies, is to contain the information concerning the notes payable by the business to others. These notes payable may be to the bank for loans or, as is sometimes the case, an account payable is closed with a note, or series of notes. When such a transaction occurs, the entry is to charge Accounts Payable and credit Notes Payable, showing the party to whom the notes were given, the date of maturity, the interest rate, and the amount, or amounts. Watch the maturity dates on all notes payable and be prepared to give them attention on the due date. This is a good practice.

53—NOTES RECEIVABLE DISCOUNTED—Under the present day method of selling some appliances, the dealer frequently takes conditional sales notes or sometimes straight notes. These he may discount, with or without recourse and in order that the transaction may be properly recorded in the books of account, this Notes Receivable Discounted account is provided. If a note receivable is discounted with recourse, the dealer not only has actually retained technical ownership of the note, but has also incurred a liability to the party with whom he discounted the note with recourse. An entry showing the payment of this note would be inaccurate, and the proper record is to show that the money received was from Notes Receivable Discounted. Thus, the Notes Receivable account remains un-

changed. Upon the payment of the note thus discounted, the entry will be to show, first, the payment of the note receivable and then the payment of the Note Receivable Discounted. If, on the other hand, the note discounted with recourse is not paid when due, the party who discounted it will return it to you and expect you to reimburse him for the amount he had paid you on the note. This entry will be recorded to show the transfer of money from your bank account to the payment of a Notes Receivable Discounted, thus paying the liability incurred at the time of discounting the note.

54—CONSIGNMENT—This is an offsetting account, for Consigned Merchandise, and the operation of this account is covered by the remarks under Consigned Merchandise.

61—ACCRUED WAGES—This account will be used to show at all times the amount, if any, of unpaid wages at the time of closing the books for the month or year. The best operation of this account is to use this account as a clearing medium for the weekly and monthly pay rolls, charging this account with the wages as actually paid and then crediting this account with the amount of the wages when that expenditure is taken into operating accounts, such as Work in Process, Indirect Wages, etc. It frequently happens that the pay roll is not completed to the stage where it may be charged directly to the operating accounts affected at the time of the payment of wages. By the use of this account, the bookkeeper will at all times be able to make her entries as they are available and should there be any delay in closing the pay roll distribution —the allocation of correct amounts to all operating accounts—she has a clearing medium which will permit her to hold any undistributed wages until she gets the proper distribution. Again, if the end of the month comes in the middle of a pay period, the wages for that portion of the pay period falling within the month just closing must be taken into account in order that they may be included in the cost of the sales made during the last few days of the month. By setting up that portion of the wages actually earned during the last part of the pay period, this actual costing of the month's sales may be accomplished with ease. By charging this account with the total of all pay rolls there will be, in one account, the data vitally necessary for the audit of pay roll tax reports.

62—ACCRUED TAXES, REAL ESTATE & PERSONAL—Taxes accrue for a year and are payable in one, and in some instances, two installments. In order that each month may carry its proper proportion of the cost of this particular expense, it is recommended that the annual tax cost for this particular kind of property be determined and each month, by proper entry, take one-twelfth of the year's cost into the expense account, Taxes—Real Estate and Personal, and place the corresponding credit in Accrued Taxes account. Thus this account will show the growing total due on taxes and upon the payment of the tax bill, the charge will be to this account, rather than direct to taxes. If one-twelfth of the year's taxes are set up in this account, beginning with January, then at the close of the year in December, this account will carry as a liability the estimated amount of taxes which will be due and payable in the early spring. With the closing of January of the new year, this account will receive the estimated one-twelfth of the new year's taxes and throughout the year this account will carry the estimated liability for taxes. Assuming that the taxes are paid in April, this Accrued Tax account would, on December 31st, of the prior year, show the estimated amount of taxes payable in April, then by the first of April this sum would have been increased by three months' taxes for the current year, payable in the following April.

63—ACCRUED TAXES—OLD AGE BENEFITS—This is one accrued tax account which should receive very careful attention. As wages are paid, you are required to withhold one per cent of the wages for the Bureau of Internal Revenue. In other words, you are permitted, under the Social Security Act, to pay only 99% of the wages to the employees and are required to withhold the remaining 1% for the United States Government. Upon payment of wages, your bookkeeper will debit, or charge, wages for the amount earned, credit cash or bank with 99%, the amount actually paid, and credit Accrued Taxes—Old Age Benefits with the 1% withheld. This tax so withheld by you from the wages of your employees belong to the Bureau of Internal Revenue and should at all times be correctly stated in your books. While it is deducted by you from each pay roll, it is required that you shall remit only after the close of each calendar quarter. In addition to the amount required to be withheld from the employee, you, as employer, are subject to a tax of a like amount. At the close of each month, a journal entry should be made to cover your portion of this tax, charging your expense account "Taxes—Old Age Benefits" with 1% of the wages and salaries paid for that month, and crediting this Accrued account; thus showing in this account the 1% withheld from your employees and the 1% payable by you.

64—ACCRUED TAXES—UNEMPLOYMENT COMPENSATION, FEDERAL.

65—ACCRUED TAXES—UNEMPLOYMENT COMPENSATION, STATE—While we have shown two accounts, one for each the Federal and

State Unemployment Compensation Taxes, it might be well to use a single account. In order to take into the expense accounts each month the actual taxes accrued, a journal entry must be made at the close of each month, charging "167—Taxes—Unemployment Compensation" and crediting either the two accounts, or single account, if so used, with the taxes accrued on the month's wages, at 2.7% for the state and .3% for the federal, or a total of 3% for both.

66—ACCRUED INTEREST—In order that interest expense might be taken into account monthly, this account is set up to contain the accrued interest until date of payment. The monthly journal entry will be to compute the month's interest on any interest-bearing indebtedness, debit the expense account, Interest, and credit this Accrued Interest account. Then, when interest is paid, the entry will be to debit this Accrued Interest account and credit the bank.

67—ACCRUED WORKMEN'S COMPENSATION INSURANCE—This insurance is based on the total amount of the pay roll, with varying rates for the different occupations. In order that the expenses for the month may include the proper charge for this type of insurance, there will be a journal entry, based upon the month's pay roll, charging the expense account "Insurance—Workmen's Compensation Insurance" and crediting this accrued account. Then, when the pay roll is audited by the insurance company and invoice is received for the insurance premium actually earned, the charge will be against this accrued account, with credit to the bank account, when payment is made.

71 — RESERVE FOR DEPRECIATION—BUILDING.

72 — RESERVE FOR DEPRECIATION—MACHINERY & EQUIPMENT.

73 — RESERVE FOR DEPRECIATION—DELIVERY EQUIPMENT.

74 — RESERVE FOR DEPRECIATION—FURNITURE & FIXTURES—These reserve accounts, while separate for each class of asset, are used in the same manner. At the close of each month, computation is made for the depreciation for the month—being one-twelfth of the year's charge—and a debit to the expense account, Depreciation, with corresponding credits to the several reserve accounts. While Real Estate is in the Building account and the two are really inseparable, depreciation is computed only on the building, at its cost. The theory of depreciation is that such a portion of the cost shall be charged into expense each year so as to permit of the recovery of the cost of the asset during its usable life. Take an automobile. Depending upon its use, it will be usable for four or five years. If its life be estimated at five years, 20% per year will cover the automobile during its life. At the end of the fourth year, there will be 20% left undepreciated and that, in all probability, is all it will be worth, even on a trade-in on a new car. There are some who think that if you take depreciation on a truck or a piece of machinery, you are not entitled to take also the cost of the repairs to that truck or machine. As a matter of fact, the usable life of a truck or a machine is predicated upon the theory that the truck or machine will be maintained in good operating condition. Repairs may, to some extent, prolong the life of a piece of equipment, but the estimated life, as used in determining the depreciation rate, takes into consideration the maintenance of the machine in good operating condition through repairs.

Capital Account

In the chart of accounts, we have assigned No. 81 for Capital Account, if individually owned; separate accounts for each partner if a partnership, and if a corporation there should be a Capital Stock account and a Surplus account. The capital account is that account which contains the investment of the proprietor, the partners or the stockholders. It is that excess of the property owned over the debts owed to outsiders. In other words, it is the difference between the Assets and the Liabilities. As to a corporation, the capital stock account should contain only the amount actually paid in for the capital stock issued. If 100 shares of $100.00 par value stock are issued for a net property payment of, say, $15,000.00 capital stock should be credited with only $10,000.00 (100 shares @ $100.00 per share) and the remaining $5,000.00 is "Paid in Surplus." If the corporation be capitalized at, say, 100 shares of $100.00 par value, or $10,000.00, and only $8,000.00 is paid in for 80 shares, the capital stock account should show only the $8,000.00. The proper manner of showing this would be to show "Capital Stock Authorized — $10,000.00," and "Unissued Captial Stock—$2,000.00." By deducting the unissued from the authorized, you would have the amount issued. After setting up the Capital Stock account, any earnings, or losses, will appear, not in the Capital Stock account, but in the Surplus account. If there be a "Paid-in Surplus" account, earnings or profits will be shown in an "Earned Surplus" account. When no "paid in" surplus appears, "Surplus" account indicates "earned" surplus. Capital stock never changes except when there is an actual payment for more stock, or the retirement of stock through purchase and retirement. The sum of the Capital Stock and Surplus accounts represents the total "net worth" of the corporation.

How To Collect Past Due Accounts

At the June meeting of the National Warm Air Assn., a speaker referred to the excellent group of collection letters gathered and made available to retail business men by the National Cash Register Co., Dayton, Ohio. The letters, so highly recommended, and recommendations for using them are published here.

IT has been said that the training of a child should begin with its grandparents. Similarly, the best way to handle past due accounts is to begin early enough to prevent them.

Business men who extend the privilege of a credit account cannot be too careful in their selection of customers who are to receive that accommodation. They should, if possible join a local association of retail credit men, and also subscribe to a good credit rating bureau. This is a service that will pay for itself by enabling the merchant to avoid unsafe risks.

A Good System Is Needed

There should be a credit system that will keep the account before the eyes of the merchant or some duly qualified person, so that it will be known immediately when an account becomes over-due or runs beyond the credit limit set. The bigger and older an account gets, the harder it is to collect.

Some merchants prefer personally to handle all credit details. But there are disadvantages to doing this. In the first place, the time and efforts of the merchant are too valuable to be devoted to other than the executive and selling ends of the business. Then again, customers are oftentimes irritated by a collection letter. If the merchant has personally been responsible for the sending of the letter, he may find it difficult to "square" himself with the disgruntled customer. On the whole, it seems to be much better for someone besides the merchant to handle all credit matters.

Some *one* person should be given full responsibility for credits and collections. All applicants for credit should be referred to this person. The decision of this person should be final. Only in this way can a merchant build up an efficient, economical and profitable credit business.

Collecting Past Due Accounts

In collecting a past due account, it should always be remembered that there is a two-fold object to be accomplished: First, to get the money; Second, to retain the good-will and patronage of the customer. An unusual degree of tact is necessary, whatever method of collection may be employed.

The telephone is used quite frequently. When the account is not too long overdue, a gentle reminder over the telephone will often be all that is necessary. The telephone can be used to the

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Letter No. 1

Mr. John Blank,
Blankville, Ohio.
Dear Mr. Blank:

Have you ever noticed how unpleasant it is to ask anyone for money that is owed you?

That is why we dislike to remind you that your account is overdue. Good business methods sometimes compel us to do things that we personally would prefer not to do. You probably have, yourself, found that to be the case.

The fact is, there is $ overdue on your account. Probably just an oversight on your part.

You may already have met this payment by the time this letter reaches you. If so, please accept our thanks. If not, just send your check right away, and we will thank you just the same.

Sincerely yours,

Letter No. 2

Mr. John Blank,
Blankville, Ohio.
Dear Mr. Blank:

When no answer is received from a "Collection" letter, it is the usual thing to pretend to believe the matter was overlooked by the other party.

But I'm going to be frank enough to admit that I believe the reason you didn't answer my last letter was because you perhaps didn't have the money right then.

In ot her words, I'm taking it for granted that you feel just as we would feel if conditions were reversed, and that you want to be as fair with us as we would be with you.

Don't you think it only fair to let us have what is due us?

Just think it over, Mr. Blank, and if you cannot possibly square your account today, let us know when you can.

We certainly will appreciate this courtesy on your part. With cordial good wishes, I am

Expectantly yours,

best effect by one who personally knows the debtor.

Collectors are frequently employed on installment or contract accounts and in cases where the article sold still remains in the possession of the debtor and can be attached. Collectors, however, can easily cause a great deal of ill will.

One of the best methods of collecting past due accounts is through the use of a series of collection letters. Here above all, tact must be used. The appeal should be varied, for all people do not respond to the same appeal.

Effective Collection Appeals

The first letter of the series should be only a friendly reminder. There must be no hint of a suspicion that the debtor does not fully intend to pay. In fact, that willingness must be assumed and made evident.

The best results are always obtained by appealing to the best in the person to whom a letter is sent. There is a desire in most of us to live up to the good opinions of others. The debtor who is treated with suspicion responds in kind. The debtor who is treated as an honorable man who will pay all his just debts, will be very likely to live up to the part.

Pride is one of the strongest appeals to the debtor who has few or no tangible assets. The publicity accompanying a suit; exposure of the fact that he is without assets; the humiliation of letting friends and neighbors know that he does not pay his debts may all be used to good effect—but used only after friendly, frank, man-to-man appeals have proved of no avail.

Future need is another strong appeal. Show what it would mean to a man who has destroyed his right to credit by not paying promptly, if a time of serious need should come and he be unable to obtain credit.

Appealing to the law is the last resort. The debtor who still has the merchandise or other tangible assets can be forced to pay by obtaining a judgment in court and an order to attach his property. This method should be used, however, only after all others have failed.

There are friendly collection letters that are astonishingly successful in bringing in the money. Use them until it is seen that the debtor is not to be influenced in this way, then go after him with these other appeals, gradually increasing the tone of sternness in the letters. Do not make the fatal mistake of threatening in one letter, and then afterward writing a wishy-washy so-called "friendly" letter.

Threats should never be used until all other means have failed. Then the merchant should do exactly what he has said he would do.

Reproduced is a good series of collection letters. These have been used and found to be unusually effective. With slight changes, they can be used by almost any business. It will be noticed that the tone of these letters is friendly and courteous, even in the last in which the debtor is told that it will be necessary for the account to be turned over to the law unless paid within five days.

There is nothing in any of these letters that could possibly offend an honest debtor. They are worded in a spirit of kindly forebearance that cannot fail to produce a favorable reaction from any debtor who honestly intends to live up to his just obligations.

Letter No. 3

Mr. John Blank,
Blankville, Ohio.
Dear Mr. Blank:

If some one owed you $ and seemingly made no effort to pay it, how would you feel?

But now suppose you had put yourself in the place of the customer, assumed that perhaps he had been hard pushed for money, and had decided to wait rather than appeal to the law to collect your money.

Then later, suppose you wrote him a friendly letter, asking him to treat you as fairly as you had treated him. Wouldn't you feel certain that you could expect a prompt response?

There are laws that regulate business, Mr. Blank. But the biggest thing that keeps business relations clean and above board is the fact that most people believe in the square deal. Business would go to smash if we couldn't depend upon the sacredness of an agreement.

That is all we ask from you, Mr. Blank, -- a square deal. You believe in that just as we do, don't you? Then let's settle this matter as between friends. A check from you by return mail will confirm our belief that you do believe in the square deal.

Earnestly yours,

Letter No. 4

Mr. John Blank,
Blankville, Ohio.
Dear Sir:

Have you thought what it means to you to have a good credit standing in the community?

Credit rating associations frequently refer to us relative to the promptness of our customers in meeting their obligations. In such cases, people who meet their payments promptly are given an A No. 1 rating, which means that they can obtain credit in nearly all the stores of the city.

So you can see that, even aside from your natural desire to live up to your agreement, it is decidedly to your advantage to do so.

This is the fourth time that we have written you in a friendly attempt to induce you to meet your obligation without forcing us to use harsh methods. We shall still hope to get some definite word from you within five days, for we should sincerely regret being compelled to take other steps.

Yours very truly,

The honest but financially embarrassed customer will in most cases explain his situation and ask for a longer period. It is pretty safe to assume that debtors who do not make any response to these letters deserve no further consideration.

Why Accounts Should Be Collected Promptly

1. Customers are usually better able to pay when account is new.
2. Customers who understand that a merchant expects his money at the time agreed upon have more respect for him, especially when they know that he "plays no favorites."
3. Prompt paying customers will learn that they do not have to bear the heavy losses due to the bad debts of others.
4. Collection is more difficult and the expense increases with the age of the account.
5. The merchant is entitled to the money he paid for the goods and his profit.
6. Number of days required to collect average account: (*)

Type of Store	Per cent sales on credit	Days to collect
Grocery	67.9	36.8
Department	45.7	57.4
Clothing	50.8	70.0
General	35.0	85.3
Furniture	76.3	172.1

*"*The Control of Retail Credit," University of Nebraska.*

7. The earlier the account is paid, the sooner will the debtor buy again.
8. The trade of past due accounts is usually transferred to some other merchant. This is not fair, of course, but nevertheless is usually an actual fact.

To collect old accounts use:

1. Statements
2. Telephone calls
3. Letters
4. Collectors
5. Personal calls
6. Law suits
7. Garnishments
8. Attachments

Send monthly statements to all your customers. This is a legal requirement. Remind them in ten days, either by phone or letter, that you expect prompt payment. Let each know you are watching his account.

It Pays to Say "Thank You"

About once a year send a personal letter to your good, prompt paying credit customers thanking them for their patronage and prompt payment. Tell them you have given them the highest rating in the credit association. Tell them you will be glad to recommend them personally if they want to open accounts at other stores in different lines. Remind them of the importance and value of keeping their credit record A-1. Letters of this kind are appreciated by customers and serve to tie them up as regular patrons of your store.

How to Use the Letters

Reproduced is a series of five letters. Each follows in proper order, and each is slightly more urgent than the preceding one. In the last letter a five-day limit is set, with the promise that no further notice will be given before other steps are taken.

These letters should go out on the firm's regular letterhead. They should preferably be typed, but if multigraphed, should be very carefully filled in. so as to give the appearance of a personal letter.

They should be mailed at intervals of one week. It is better to date and mail letters so that they will be received on Wednesdays or Thursdays rather than on the first or last days of the week.

The amount owing is mentioned in the first letter. A statement of the account should be enclosed with the third and fifth letters.

The fifth letter should be *registered* and the envelope marked "Return Receipt Demanded" so that delivery may be certain. Then again, should the debtor have moved, this will give you his new address. The main reason, however, is pure psychological—it shows the debtor that you mean business and that prompt action on his part is

(*Continued on page* 115)

Letter No. 5

Mr. John Blank,
Blankville, Ohio.
Dear Sir:

It is with sincere regret that we notice you have made no attempt to do anything on your account within the five day period set in our last letter.

We use the words "sincere regret" because no other words could properly express our feelings. There is nothing in connection with our business that we value so highly as our friendly relation with our customers. We try to be worthy of their friendship always. We can expect nothing else from them.

It is just possible that you have been sick or away from home and so have been unable to reply to our previous letters. On the chance that this may be the case, and to avoid if possible any steps that would injure your local credit, we shall wait five more days before taking any other steps.

At the expiration of that time, however, we shall feel justified in considering that we have done all in our power to settle the matter as between friends. That will leave us nothing to do but turn your account over to our lawyer. You will receive no further notices.

It is our earnest hope that you will make it unnecessary for us to do this by squaring your account at once.

Yours truly,

Sheet Metal Courses Given in Connection With the National Defense Program

By L. S. Hawkins
Chief, Trade and Industrial Education Service
Federal Security Agency, U. S. Office of Education

"PRE-EMPLOYMENT refresher" courses in sheet metal work are being taught in eighty-five schools in twenty-eight States, and "supplementary" courses in sheet metal work are being given in fifty-four cities in nineteen States in the national defense training program known as vocational education of defense workers.

By pre-employment courses is meant specific instruction for persons selected from the public employment office registers and who, upon completion of the training courses, will be qualified for employment in occupations essential to the national defense. The objective of the pre-employment course is to qualify the trainees for employment in specific pay roll jobs in occupations essential to national defense.

By supplementary courses is meant instruction offered to employed persons who are engaged in occupations essential to national defense or in allied occupations, for the purpose of extending their skills and knowledge in essential skilled occupations. The objective of the supplementary courses is to "upgrade" persons who are employed in essential or allied occupations. It is also the purpose of these courses to upgrade those individuals who have received instruction in pre-employment courses and are now employed.

The following is a tabulation by States and cities in which sheet metal courses of the pre-employment refresher type are being offered:

Pre-Employment Refresher Sheet Metal Courses

State	City	Number of Schools
Arizona	Phoenix	1
California	Los Angeles	1
Colorado	Denver	1
	Boulder	1
	Colorado Springs	1
	Pueblo	1
Florida	Jacksonville	1
Georgia	Atlanta	1
	East Point	1
	Columbus	1
	Macon	1
	Savannah	1
	Walker Park	1
Illinois	Chicago	2
	Peoria	1
	Champaign	1
	Cicero	1
	East St. Louis	1
Indiana	Evansville	1
	Connersville	1
Kansas	Wichita	1
Kentucky	Louisville	1
Maine	West Brook	1
Maryland	Baltimore	1
Massachusetts	South Bridge	1
	Haverhill	1
	Quincy	1
Michigan	Detroit	4
	Flint	1
	Kalamazoo	1
	Jackson	1
	Pontiac	1
	Saginaw	1
	Chelsea	1
New Jersey	Elizabeth	1
	Jersey City	1
	Irvington	1
New York	Utica	1
	Troy	1
	Binghamton	1
North Carolina	Charlotte	1
	Durham	1
North Dakota	Fargo	1
Ohio	Akron	1
	Toledo	1
	Cleveland	1
	Troy	1
Pennsylvania	Philadelphia	6
	Erie	1
	Landsdown	1
	Altoona	1
	Allentown	1
South Carolina	Charleston	1
South Dakota	Aberdeen	1
Tennessee	Knoxville	1
	Memphis	1
	Whitehaven	1
Texas	San Antonio	1
	Dallas	1

State	City	Number of Schools
Virginia	Richmond	1
	Schoolfield	1
Wisconsin	Milwaukee	1
	Menomonie	1
	Fort Atkinson	1
	Kaukauna	1
	Rhinelander	1
	Janesville	1
	Wausau	1
	Superior	1
	West Allis	1
	Oshkosh	1
	La Crosse	1
	Green Bay	1
	Madison	1
Wyoming	Evanston	1
	Cheyenne	1

The following is a tabulation by States and cities in which supplementary sheet metal courses are being offered:

Supplementary Sheet Metal Courses

State	City	Number of Schools
California	Burbank	1
	Glendale	1
	Inglewood	1
	Long Beach	1
	National City	1
	San Diego	1
Georgia	Macon	1
Indiana	Evansville	1
	Fort Wayne	1
	Gary	1
Kentucky	Louisville	1
	Paducah	1
Louisiana	Shreveport	1
Maryland	Cumberland	1
Massachusetts	Haverhill	1
Missouri	Joplin	1
	St. Louis	1
New York	Binghamton	1
	Bronx	1
	Brooklyn	4
	Buffalo	2
	Elmhurst	1
	Floral Park	1
	Niagara Falls	1
	Port Chester	1
	Rochester	4
	Syracuse	1
	Troy	1
	Utica	1
	White Plains	1
	Yonkers	1
North Carolina	Charlotte	1
Ohio	Newark	1
	Toledo	1
	Troy	1
	Youngstown	1
	Zanesville	1
Oklahoma	Tulsa	2
Pennsylvania	Altoona	1
Tennessee	Spartanburg	1
Texas	San Antonio	1
Utah	Ogden	1
	Salt Lake City	1
Virginia	Hampton	1
Washington	Seattle	1
West Virginia	Charleston	1

The need for sheet metal courses, as well as for all other courses given in connection with the vocational education of defense workers, is determined by the local vocational school authorities with the specific advice and counsel of representative groups among employers, workers, and public agencies.

Derivation of Authority and Funds

The first phase of the defense training program derived its authority last summer from Public Law No. 668, which appropriated $15,000,000 for supplementary courses and pre-employment refresher courses. On October 9 Congress approved Public Law 812 appropriating $60,500,000 for several types of defense training programs. This appropriation is to be divided as follows: $26,000,000 to be allotted by the U. S. Office of Education to State Boards for Vocational Education for the continuation of the pre-employment refresher courses and the supplementary courses described previously. (2) $8,000,000 is appropriated for the purchase, rental, or other acquisition of new or used equipment when needed by agencies in providing pre-employment refresher and supplementary courses as described previously. (3) $9,000,000 for short courses in engineering colleges and universities to meet the shortage of engineers in fields essential to national defense. This is the one phase of the defense training program which will not be administered through the State Boards for Vocational Education, but through qualified colleges and universities having special facilities for such training.

The demand for this kind of training has been stimulated by the enormous expansion in such industries as aircraft, shipbuilding, and new armament industries which has created an acute demand for engineers trained in special fields. (4) $10,000,000 for the training of rural and nonrural youth for national defense. This aspect of the program will help to equalize the opportunities for youth especially youth in rural areas, to share opportunities for service in the national defense program and will provide training for use of skill for rural youth and nonrural youth in mechanical occupations common to the farm, but also basic to defense industry needs. Within the last 20 years many rural high schools have established farm mechanics shops in connection with vocational

(*Continued on page* 112)

The Problem Corner . . .

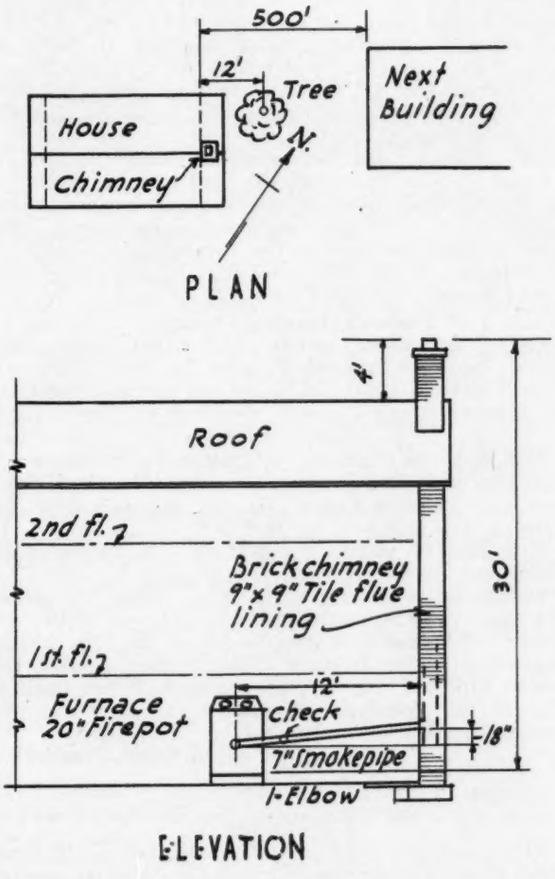
Poor Draft Causes Puff-Backs

American Artisan:

We are enclosing a sketch showing the layout and approximate measurements of a problem.

The trouble is at night when the fire is low, the gas backs up into the house and is highly dangerous. It is so bad it sometimes blows open the furnace doors. When the fire burns briskly in the daytime, the job is all right and is also all right in mild weather. We sealed shut the check damper, also tried a back draft diverter on the top of the chimney with measurements as shown in the 1939 Guide, page 202. These did not help the situation at all as the gas seems to be forced out the front door of the furnace.

Also in our district our competitors are installing gravity furnace jobs using rectangular or square ducts with no elevation on the mains, using probably two or three trunk lines which have a larger area than the branches each



serves. The branches (which consist of probably 2 elbows and a short piece of pipe of 3½ x 10 inches and larger) are cut into the top or top of the side of the main trunk line and the main is then reduced in size.

Plenum chambers resembling those used in forced air work are used on top of the furnace. Dealers seem to be able to cut on the price of installing with this type of system. The customers claim they work satisfactorily. We would like your opinion on this as we are afraid to try this kind of installation. I presume it is what is called the extended plenum system. Where could we get some information as to proper sizes to use? I have quite a number of books and information on furnaces but can not find anything on this type of installation.

We appreciate your problem corner where we can turn when in need of expert advice through the proper authorities. Thank you.

J. H. M., Canada.

Reply by The Editors

We would like to submit your problem on chimney draft to one and possibly two contractors who have made something of a hobby of chimney draft.

Our own personal opinion is that this outside chimney in your area becomes very cold at night and when the fire is checked the volume of cold air in the chimney probably becomes so heavy that it takes quite a fire to change the chimney air temperature and start natural draft. It is quite possible that during the time the air in the lower part of the chimney is warming up, the pressure of the cold air column above is sufficient, to cause smoke puff-backs out of the fire door.

It seems to us that probably the simplest remedy is to install a one-pipe forced draft blower on your smoke pipe and control this so that it starts a positive movement of air up the chimney whenever the thermostat calls for heat or whenever the smoke pipe or flue temperature falls to such a low level that puff-back occurs. Of the two methods of control, we suggest that low smoke pipe temperature is probably the best.

In answer to your second question, this practice seems to follow that suggested by Williamson Heater Company, Cincinnati, who at one time used and may still use an extended plenum with branches tapped off the top or side of the run. Rudy Furnace Company with its Rudy loop also does much the same thing excepting that the loop is a complete circle starting from both sides of the furnace plenum.

If you will send us a more exact description of the job or the pipe sizes and a duct sketch showing a typical layout, we may better identify the type of work.

The University of Illinois, Engineering Experiment Station, has reported quite favorably on rectangular mains without pitch on gravity furnaces—where the bonnet of the furnace is carried up to the floor joints so that there develops a positive pressure inside this high plenum. The method of flat rectangular pipe is not recommended for low bonnets or for the ordinary type of bonnet which you have with pitched warm air leaders.

Reply by L. W. Millis
Security Stove & Mfg. Co., Kansas City

First, I assume that the chimney, as described, is properly constructed, so that no leakage of air can come down the outside of the tile and find its way into the flue at the many tile joints and that there is no other overlooked source of air supply to weaken the chimney draft, also that the tree shown is not responsible because the trouble is mostly at night. I believe you will find that the basement is extremely tight and that there is not enough air leakage into basement to support combustion over a long period. During the day various trips to the basement let in enough air to keep fire going, but at night the air supply needed to sustain combustion is only that due to leakage into basement and it is probably that a momentary reversal of pressure takes place blowing foul gases and some smoke into basement.

If this is the correct analysis of the case, then it is manifest that a positive air inlet into basement should be provided. A four, five or six-inch butterfly in window-pane or some similar device will let in the needed air. I know you will pardon the mention of my coal hobby. Wherever possible, coal in a furnace should be placed so that there is a low spot at which a flame is visible and acts as a pilot in igniting the gasses yielded by the volatile matter in the fuel. This will do away with explosions. It is often advisable to use a low volatile coal to avoid explosions. But that is another story. I would also suggest that when the present seven inch smoke pipe needs replacing, an eight inch be used. It will make a big difference.

Association Activities

National Warm Air Heating and Air Conditioning Association Annual Program

The program of the National Warm Air Heating and Air Conditioning Association—27th annual convention to be held December 10 and 11 at the Hotel Statler, Detroit—follows

W. J. Cameron

Mr. Cameron, nationally known radio speaker and public relations counselor for Ford Motor Company has a timely message for all members of the warm air heating industry.

Robert K. Thulman

Mr. Thulman, Mechanical Engineer, Federal Housing Administration, will speak on the consumers angle of the "Yardstick for the Evaluation of a Forced Warm Air Heating System." The "Yardstick" is a brand new twenty-page, letterhead size booklet, which has taken two years to produce. It will guide the industry to higher standards of installation practice.

The Warm Air Furnace Quintet

Four fine men and one fine woman. A one-and-one-half hour stage playlet on "How to Sell the 1941 Replacement Market." It will hold your attention. It is a streamlined, educational, humorous and dynamic offering which shows the retailer how to turn red ink into black. Dealers, Jobbers, Distributors and Manufacturers just can't miss this. It is worth a hitch-hike across the continent.

Professor Kratz and Professor Konzo

Professors Kratz and Konzo of the University of Illinois will talk on a number of interesting subjects and present papers on technical research progress. A full half day has been set aside for our technical program. Technical research and engineering is the foundation of our Industry. Be sure to attend this session.

Air Information—If You Please

The Committee of Six with L. R. Taylor, Past President of our Association, as Chairman will answer questions from the floor. Maximum of five minutes for questions and answers. Bring your problems with you and deposit them with the Committee.

Training Course Committee

John W. Norris, Chairman, will present an outline of the new approach in a basically new Correspondence Course and Laboratory Course for Dealers and other members of the Industry. This Course will make money and save money for members of the Industry. Everyone should hear Mr. Norris' presentation.

Michigan State College Short Course Committee

Professor Lorin G. Miller, Chairman, has an interesting message on the benefits to be derived from the Tenth Annual Forced Warm Air Conference to be held at Michigan State College, East Lansing, Michigan, in March of 1941. This Course is sponsored by the National Warm Air Heating and Air Conditioning Association and conducted by The Mechanical Engineering Department, Michigan State College. Be sure and hear Professor Miller.

Publicity and Merchandising Committee

Frank E. Mehrings, Chairman, will give an outline of the new Consumer Booklet and Standard Contract Specification Form which his Committee is developing. Mr. Mehrings will also talk on the Merchandising and Publicity aspects of the "Yardstick for the Evaluation of a Forced Warm Air Heating System."

Research Advisory Committee

Fred G. Sedgwick, Chairman, will report on the plans for our Technical Research Program for the coming year. He will also tell about the hidden and surface benefits to the industry of our Technical Research Program.

Codes Committee

B. F. McLouth, Chairman, will outline the changes which have been made in the new editions of the Standard, Practical and Technical Codes. He will also tell about the plans of his Committee for 1941.

A number of additional reports will be presented by other Committee Chairmen.

We extend to every manufacturer, jobber, distributor and dealer who is interested in the progress of this Industry our cordial invitation to attend the 27th Annual Convention of the Industry, Hotel Statler, Detroit, December 10th and 11th. We are fortunate in being able to offer on this Convention Program many plans and subjects for profitable development of the Industry.

C. A. Olsen, President.

Indiana

The date for the Indiana Sheet Metal & Warm Air Heating Contractors' Association convention has been set for the first week in February, 1941. The days will probably be Tuesday, Wednesday and Thursday, the 4th, 5th and 6th.

The Convention is being brought back to Indianapolis after having been held out in the State for three years. The decision to bring it back to Indianapolis was based on a request received from the Furmets asking for an old time Indianapolis Convention and pledging their support. A joint meeting of the officers and directors of the Contractors' Association and the Furmets was held and the details were discussed.

The Convention Committees will be made up from contractor nominations by President Elmer Mullin of the Association, and Furmet members nominated by President Frank Mutz of the Furmets.

Paul R. Jordan, Executive Secretary.

Michigan

At a meeting of the Board of Directors of the Michigan Sheet Metal, Roofing, Heating and Air Conditioning Contractors' Association, held at the Hotel Olds, Lansing, on October 23rd, it was decided that our 1941 convention would be held in Kalamazoo, Michigan on March 4, 5 and 6.

The program details remain to be worked out; however, for the first time there will be separate meetings held for the heating and roofing groups. Obviously the furnace people are not interested in roofing, and vice versa.

The Warm Air Division of our association has been actively engaged all thru the year in forming local associations in the various cities, and it has been very successful. Definitely the industry is association minded and it is merely a question of getting them together.

Plans are well under way for the submission of a state Code to the next legislature.

E. C. Spraker, Secretary.

Association Activities . .

Wisconsin

The October 11 meeting of the Sheet Metal Contractors' Association of Wisconsin was called to order by President T. L. Brenner in the presence of directors and members Brennen, Mantei, Krueger, R. F. Gehrke, Hielcher, G. G. Jones, and Paul L. Biersach. M. L. van Lannen of Green Bay mailed us an excuse for being unable to be present.

Chairman Kramer of the Convention Committee detailed our activities on convention matters. The annual convention is scheduled for February 10, 11 and 12, 1941, at the Hotel Pfister, Milwaukee. The Convention committee invites contractors to bring their wives and sweethearts.

Chairman R. F. Gehrke of the National Association affairs, and who, with Director Van Lannen, has charge of and under consideration the Code of Ethics, reported that they would meet shortly and would present their findings at the November meeting.

Contracts for advertisements in our annual Year Book and booth space reservations for the annual convention were reported. Chairman Kramer reported what we had under consideration as to entertainment, our contacts with various speakers. It was suggested that we set aside all day Tuesday for members and business only, that Monday morning should be set aside for the exhibitors and that the real convention will be opened on Monday afternoon.

The license proposed by the Wisconsin State Council of Sheet Metal Workers was then liberally and lengthily discussed, and all were of the opinion that the subject was given more than considerable time and discussed at our last two conventions. R. H. Gehrke moved and Paul Krueger seconded a motion, that owing to the expense involved and the indifference shown by the majority of the members toward such a law, that further negotiations should cease and the matter considered disposed of. The motion was unanimously approved.

The balance of the afternoon was dedicated to "Overhead." All entered into this discussion, various ways and forms were brought forward—the Racine representatives submitted a complete setup as to how they obtain their costs and overhead on any particular job; the Chair explained his methods; Gehrke gave his experience and adaptation of overhead; Krueger supplied their methods. The time was well spent for those present in considering various methods used and applied.

The next meeting was called and set for Friday, November 8th.

Paul L. Biersach, Secretary.

◆

South Chicago

The Associated Sheet Metal and Air Conditioning Contractors Association started their fall and winter meetings with a nice crowd of their own members and a splendid attendance of visitors. The meeting was designated as Northwestern Stove Repair night, and after president John Bierma officially opened the meeting, the gavel was handed over to Bill Geirman, manager of the South Chicago Branch of Northwestern Stove Repair.

Mr. Geirman called on a few of the visitors—E. C. Carter, Lou Reining of Thermo-Drip, Howard Mason of Chicago Furnace Supply and several others. All gave interesting talks.

The association proposes to hold an open meeting soon to include some prominent men to demonstrate pattern tools, insulation, and other representatives to show the use and practicability of the various products. We propose to keep up a series of worthwhile meetings during the winter months.

Our residential building is going along fine—too much of it at dog-eat-dog prices—a great majority of gravity jobs being installed by CIO and AFOL and a large percentage of non-union work, at various wage rates.

As to mechanics, no school is provided in our area nor in Chicago to teach boys out of school the practical, skillful uses of sheet metal tools, unless they sign up with a union. We have only union instructors here and they devote a student's time in the proportion of about 40 percent to union guiding and instruction, 20 percent blue print reading, 20 percent sheet metal layout work. Our area needs men who can make up and hang gutter flashing, ducts, casings and caps, and do such shop work as ordinary soldering, etc.

A. R. Harris, Secretary.

◆

Florida

The Roofing and Sheet Metal Contractor's Association of Florida reports that the August unemployment payments of the Florida Industrial Commission reached the highest total since payment started 19 months ago. The total of the benefit payments was $907,552.84.

Ten shops have answered the Questionnaire attached to The Florida Roofer last issue. These shops report a total of 199 sheet metal men, roofers and helpers employed. The lowest rate reported for Sheet Metal Workers is $0.75 per hour at Hollywood, and the highest is $1.50 per hour at West Palm Beach. Roofers receive from $0.45 per hour to $1.25 per hour. Helpers receive from $0.30 to $0.50 per hour.

Schools in the Jacksonville and Daytona Beach areas are offering sheet metal training.

The Florida Industrial Commission is organizing the Florida Industrial Safety Council to work with employers and employees by educating them to become safety-minded. In this way accidents may be decreased in number and compensation insurance rates be lowered. It is planned to hold tri-monthly educational meetings on safety in each of the five congressional districts beginning the latter part of October.

The Florida Roofer asks members to report any serious accident in their shop this past year to give other shops the value of their information.

L. A. Burgess, Secretary-Treasurer.

◆

New York City

The Committee on Specifications of the Roofing and Sheet Metal Crafts Institute, Incorporated, New York City has issued its first set of specifications for a standard roof. No insurance certificate will be issued through the Institute to owners unless these minimum specifications have been complied with. The Roofing & Sheet Metal Crafts Institute's minimum requirements for the insurance bond are as follows:

A four course roof, consisting of at least one No. 12 tarred or asphalt felt and a ¾ pound cap sheet with two bitumens. A five course roof, consisting of at least two No. 12 tarred or asphalt felts and three bitumens.

Where a new roof is applied over the old slag, grit or gravel surface, the old surface is to be scraped clean and the scraped slag, gravel or grit removed from the roof surface before the above specifications are complied with.

Where the slag roof is applied, it shall consist of at least two tarred or asphalt felts and three bitumens with a surfacing of at least 300 pounds of slag for each 100 square feet or 400 pounds of gravel for each 100 square feet.

The applicant for the bond is to understand and acquaint the owner with the fact that the roof will be subject to a cut test by the Institute if they should desire, before the bond is issued. If the Institute feels that the specifications have not been complied with they may at their discretion refuse to issue the bond.

This is a double barrelled insurance for the owner inasmuch as when he signs the roofers application for a bond, he will know that he has gotten the specification called for, if the bond is issued.

(*Continued on page* 90)

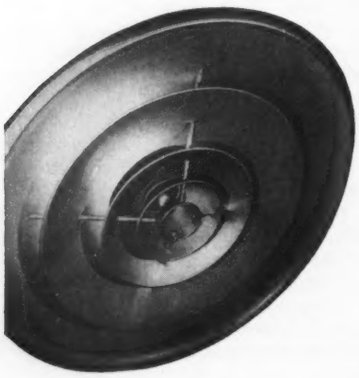
New Products

For your convenience a number has been assigned each item. Circle the items in which you are interested on the coupon on page 89 and mail to us.

● Indicates product not listed in 1940 Directory.
△ Indicates manufacturer not listed in 1940 Directory.

218—Improved Anemostat

The Anemostat Corporation of America, 10 E. 39th St., New York City, announces an improved and modified design to take the place of the former Type "C" Anemostat. The diameter of the outer cone has been



reduced from a dimension approximately three times the neck diameter to a dimension approximately two times the neck diameter, to permit the installation between beams with a minimum of structural framing.

The outer cone is finished with a moulded edge.

◆

219—Combination Furnace Controls

Minneapolis - Honeywell Regulator Company, 2950 Fourth Avenue South, Minneapolis, announces new combination controls with installation instruction sheets. This line—the LA101,

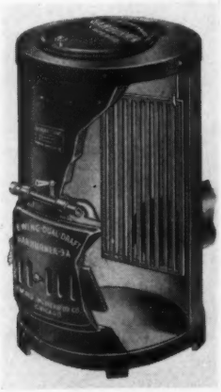
LA201 and LA401 combination furnace controls—combines the functions of an automatic fan switch and a high limit switch in one case. The new cover, finished in black Kristo-Krak, encloses the front and two sides of the instrument, while the plated base is constructed to form the top and bottom of the control.

◆

△220—Garburner

Ewing Incinerator Company, 2432 Irving Park, Chicago, offers the Ewing-Dual-Draft Garburner for incineration in the modern home.

The Ewing-Dual-Draft Garburner 3-A or 3-A-G is steel encased, the



sides being lined with a special heavy refractory material. The heart is of special heavy cast iron. A 10x12 clean out door provides for removal of ashes, cans, etc. A heavy cast iron deflector plate is attached to the ash door directing the incoming air to the base of the material to be burned. A heavy semi-steel by-pass grate is hung from the top, 4 inches in front of the flue pipe which is taken off the back of the unit. A 12-inch feed door is located on the top.

◆

●221—Colaweld "T" Rod

Colonial Alloys Company, E. Somerset, Trenton Avenue and Martha Sts., Philadelphia, announces Colaweld "T" Rod for joining and especially soldering aluminum and its alloys, without flux.

Colaweld "T" Rod is also a joining material for 18-8 stainless steel, coppers, brasses, monel, steels, galvanized, etc., when used with Colaweld Liquid (flux).

Sample test lengths of Colaweld Rod are available at a nominal cost.

Method of application is much like soldering and instructions are available for joining, filling casting holes or cracks and for inaccessible places, such as under lap joints.

●222—Ritz Air Hammer

Season-Aire Corporation of America, 20 Bartlett Ave., Detroit, announces the Ritz air hammer for finishing Pittsburgh locks; 24 to 30-gauge metal.

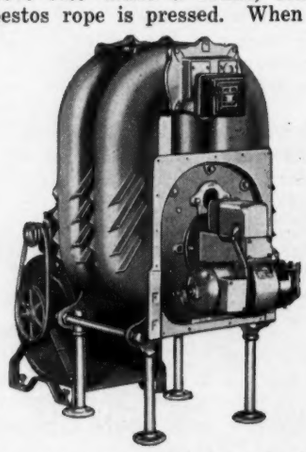
The Ritz weighs only 2½ lbs.; operates from any ⅛ to ½ h. p. compressor.

◆

223—Unique Air Conditioner

The Excelsior Steel Furnace Co., 118 S. Clinton St., Chicago, offers the Excelsior Unique oil-burning air conditioner with cast iron heating element—a special chrome-alloy mixture.

The heating element is made in sections, each section a one-piece casting of chrome-alloy cast iron approximately one-quarter inch thick. Special fins are cast as integral parts of each section. The joints between the sections are surface-ground flanges. Around the ends of each flange is a groove into which a round, braided asbestos rope is pressed. When the



rope is in place and before the bolts are tightened, the flanges stand an eighth of an inch apart. When the bolts are pulled down tight, the asbestos rope is compressed to make a permanently tight joint.

The cast iron combustion chamber has a pre-cast refractory lining.

The Excelsior Unique oil burner, pressure atomizing type, has been redesigned.

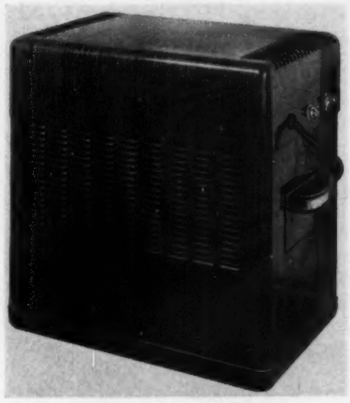
Controls consist of room thermostat, Protectorelay and combined limit and blower switch operating individually.

The attractive casing is finished in dark maroon baked enamel.

Large size blower, Thermo-Drip automatic humidifier and large size filters are included. Btu output at grilles is 75,000.

New Products . . . . . .

For your convenience in obtaining information regarding these items, use coupon on page 89.



224—Sanidaire Humdifier

United States Air Conditioning Corporation, Northwestern Terminal, Minneapolis, announces Sanidaire, a new portable humidifier.

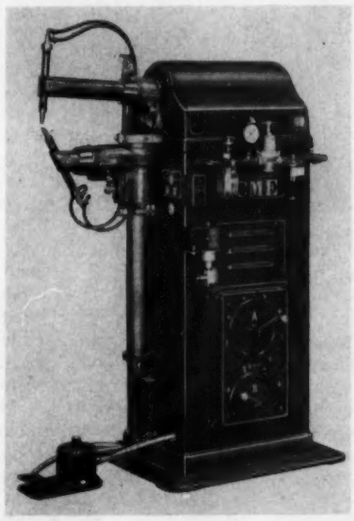
Sanidaire is designed to deliver 300 cfm. of washed, filtered, humidified air.

◆

225—Hot Spot Welders

Acme Electric Welder Company, Huntington Park, Cal., announces a complete line of air operated rocker arm type spot welders in transformer capacities of from 10 KVA to 75 KVA. This line is described in their Bulletin No. 52.

These spot welders come completely equipped with automatic weld timers



and welder service magnetic contactors and are offered in various styles actuated by a foot valve and limit switch, by a solenoid operated mushroom type floor switch, or by a specially designed two-stage toe-operated floor switch. They are available in either single spot non-heat or automatic repeat operation.

226—Two-Speed Fan Controls

Minneapolis - Honeywell Regulator Company, 2950 Fourth Avenue South, Minneapolis, announces new combination two-speed fan controls—the LA-145, LA245 and LA445—for use in conjunction with forced warm air

heating systems to control specific types of 2-speed fan motors.

The fan operation is controlled by the bonnet temperature independently of the thermostat, starting at low speed and switching to high speed on a temperature rise. When the manual external summer-winter switch is set to the summer position, the fan will operate at high speed.

The black Kristo-Krak cover is the same as for the combination furnace controls.

◆

227—Oil A. C. Furnace

L. J. Mueller Furnace Co., 2005 W. Oklahoma Avenue, Milwaukee, offers the No. 57 oil-fired winter air conditioning furnace—a new and larger addition to the Series "50" oil-fired line.

The No. 57 has a Btu. capacity at register of 200,000 and 225,000.

All units in the Series "50" line are completely enclosed in a green and black crinkle lacquered, rock wool in-

sulated casing. The fan and motor assembly is cushion mounted and rubber insulated, with "V" belt drive and variable speed sheave. The filters are replaceable. The drum and radiator are of heavy gauge steel and electric welded.

228—Directaire

Fitzgibbons Boiler Company, Inc., 101 Park Avenue, New York City, now offers a complete range of direct-fired winter air conditioners for the small home.

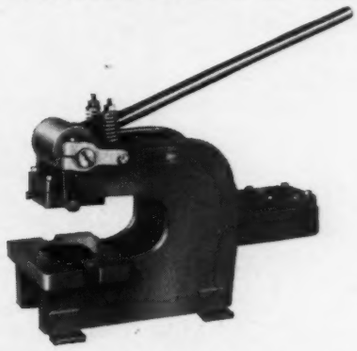
These new conditioners with newly designed streamlined jackets are manufactured in three sizes—65,000, 85,000 and 100,000 Btu. output at the bonnet. They utilize the principle of two concentric heat exchanger drums around which filtered air is circulated.

A separate fan and motor assembly is designed to eliminate vibration. A centrifugal multi-blade fan, dynamically and statically balanced, runs on ball bearings encased in rubber pillow blocks, and is driven by a resiliently mounted motor with a built-in thermal cutout. A variable pitch motor pulley simplifies control of the volume of air delivered to the rooms. Throw-away type filters and a float-type humidifier are used.

△229—Hand Punch Press

The Leslie Welding Company, 2943 Carroll Avenue, Chicago, announces a hand operated punch press that has no ram, ways or slides.

A unique feature of this press is the means for maintaining alignment or registration of punches and dies in



a leaf arm that is rigid except at its flexing point.

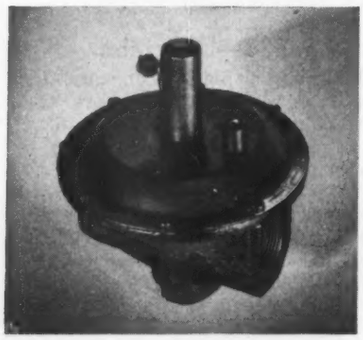
The punch plate is 4x4¼ in. The clearance from punch plate center to frame is six inches. Stroke is $\frac{7}{8}$ in. and stroke adjustment is ⅛ in. Capacity is 2 in. diameter hole through 14 ga. mild steel or 16 ga. 18-8 stainless steel.

New Products . . . . . .

For your convenience in obtaining information regarding these items, use coupon on page 89.

230—Gas Regulator

General Controls Co., Glendale, Calif., announces the V-300 series of low-pressure gas regulators for use on domestic and commercial gas appliances. These new, small, compact regulators are available in sizes from ⅜-in. to 1¼-in. with standard outlet pressure sealed at 3½-in. water column, but with a minimum outlet pressure of 2 in. and a maximum of 5 in. water column.

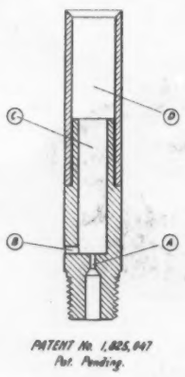


All internal parts are resistant to corrosion for natural and manufactured gases. ⅜-in. and ½-in. small regulator bodies are of sand cast aluminum, larger size bodies are of cast iron. Diaphragms are of leather, oil treated for sensitivity and long life. Rugged single seated valve principle assures positive alignment and simplified control with a minimum of pressure drop.

◆

△231—Gas Burner Tips

General Engineering Works, 4701 W. Division St., Chicago, offers two-stage gas burner tips, designed to operate silently with any of the common fuel gases by properly sizing the gas orifice and regulating the gas pressure. The gas burns with a soft blue flame and will not flash back.



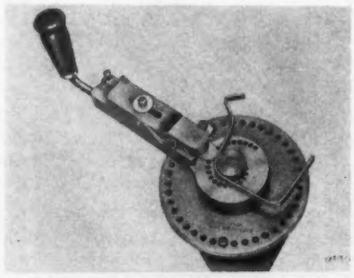
PATENT No. 1,825,947
Pat. Pending.

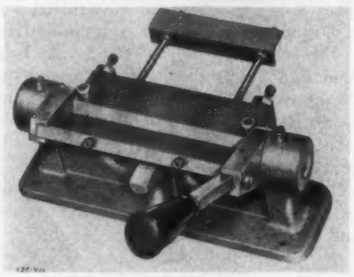
In the sketch, A represents the gas orifice, B the primary air slot, C the first stage and D the second stage.

△232—Duplicating Without Dies

O'Neil-Irwin Manufacturing Co., 318 Eighth Avenue South, Minneapolis, offers metal duplicating units for light and medium materials.

The Micro line of die substitute machines was designed to eliminate the expense of making blanking or forming dies where small numbers of metal stampings were required, or for eliminating one or more of the operations necessary in making complicated progressive dies. The line consists of a precision bench bender, brake, folder, press, punch, rod cutter, roller and shear, also a power-driven nibbler, swage and wire straightener.





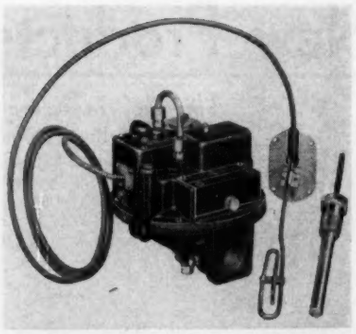
The bender and shear are shown.

◆

233—Flexible Duct Connection

Grant Wilson, Inc., 4101 W. Taylor St., Chicago, offers flexible duct connection for the air conditioning, warm air heating and ventilating industries.

Flexible duct connection is a woven flexible asbestos band 6 in. wide, put up in a roll 50-ft. long. Both edges are selvaged to prevent fraying or ravelling, and to make a tight permanent joint. Flexible duct connection can be clamped, bolted or screwed securely into place.



•234—Diaphragm Gas Valve

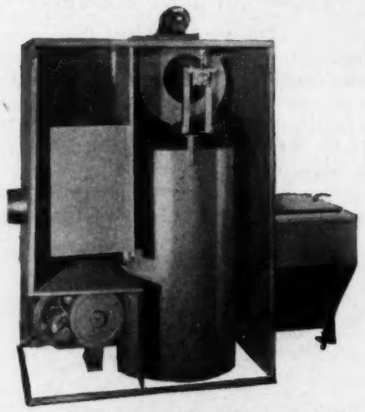
White-Rodgers Electric Company, 1209 Cass Avenue, St. Louis, Missouri, has developed a new diaphragm gas valve with puff bleed and built-in mechanical limit control. The valve has an automatic recycling feature, which, if the valve is opened manually, will return it to normal automatic operation upon resumption of power service.

◆

235—Stoker Furnace Unit

Kol-Master Corporation, Oregon, Illinois, has recently developed a stoker furnace unit for low-cost houses in both hopper and bin-feed types, rated at 110,000 and 125,000 Btu at the register.

The unit includes a counter-flow furnace, circulating fan and filters, and is equipped with a Kol-Master stoker. Either the Kol-Master Dial-Set or Weather-Master is provided.



The "brain" of the machine is a diaphragm that operates a pressure switch and in turn operates the feed motor. The diaphragm is a small, conveniently located housing, which contains the single control dial of the machine. The diaphragm is connected to the wind box by a small, flexible copper tube. The amount of air pressure exerted on the diaphragm through this copper tube is determined by depth of the fuel bed in the retort. The deeper the fuel bed, the greater the back pressure.

The Diaphragm is adjusted so that when the fuel bed has built up to proper height, back-pressure on the diaphragm raises the pressure switch and shuts off the flow of coal.

The air control is set so that the right amount of air for most efficient combustion is supplied to the fire.

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This enlarged, second edition of FORCED AIR HEATING reduces the task of designing forced air heating systems to a simple, easy-to-follow procedure. Four reasons why contractors will find this book unusually helpful—a real time and money saver in forced air work—are these:

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Second—It outlines for you, step by step, a suggested designing procedure which you can follow in planning any job in quick time, and yet with assurance that the finished installation will perform according to specifications.

Third—It shows you shorter and easier, but thoroughly dependable methods of calculating heat losses, sizing apparatus, selecting register air temperatures, figuring pressure losses, and determining correctly all other factors that must be considered in planning a forced air heating system.

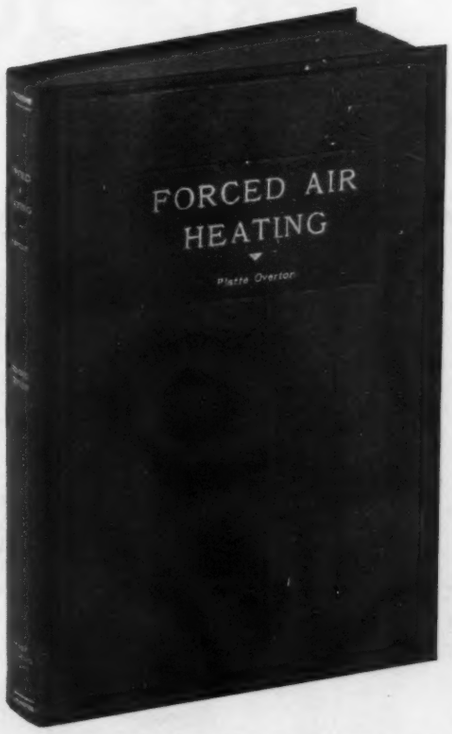
Fourth—It gives you sufficient practical information on all phases of forced air work to equip you to work out readily and correctly any unusual designing problems you may encounter on your different jobs.

FORCED AIR HEATING'S primary object is to show you how your designing problems can be speeded up and simplified. The methods this book recommends are a safe balance between the theoretically perfect procedures which require an excessive amount of time, and the haphazard methods which so often result in costly omissions or mistakes. They are procedures which have been proved completely reliable, as well as important time-savers, through successful application to many hundreds of forced air jobs of all sizes and complications.

WRITTEN IN PLAIN LANGUAGE

Every thought and device to make this second edition a practical, every-day guide to better and more rapid procedure in forced air heating design work has been included in it. It is written in the plainest possible language, and filled with illustrations and concrete examples that make each recommended procedure easy to understand and to apply.

Begin now to improve and to speed up your designing methods—equip yourself to do more and better forced air work at a better profit—by sending $1.00 today to the address below for a copy of FORCED AIR HEATING.



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—Mechanical Code for Forced Air Heating
—Sizing Ducts by Friction Chart Method
—Sizing Extra Long Runs
—Pressure Losses
—Velocities
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—Branch Take Offs
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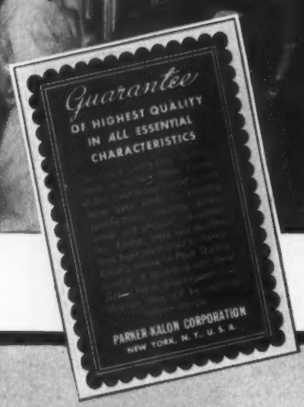

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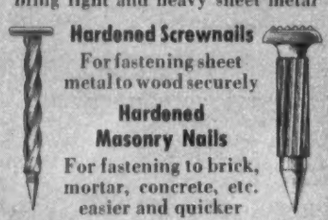

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New Literature . . . .

For your convenience in obtaining copies of new Literature use the coupon on page 89.

255—Thermostat Catalog

The Spencer Thermostat Company, Attleboro, Mass., manufacturers of Klixon snap-acting controls for heating and air conditioning equipment, has just issued a new catalog with illustrations, specifications and prices for room thermostats, limit controls, fan switches, duct thermostats, stoker timers, thermal time relays and other controls for heating and cooling. The 32-page book features many new controls as well as price revisions on others.

Of particular interest to the gas field is a new line of electric diaphragm gas valves, as well as pilot switches and other controls for automatic gas-burning equipment.

◆

256—Thru-Wall and Concealed Flashing

Chase Brass & Copper Co., Waterbury, Conn., has prepared a folder with information to help architects and engineers write definite flashing specifications.

Metals used for flashing purposes and their comparative efficiency as flashing material is discussed briefly. Information is also included on (1) Why you need Thru-Wall flashing; (2) Why you need Concealed Flashing; (3) Where they should be installed; and (4) How they should be installed.

◆

257—Practical Farm Building Plans

Continental Steel Corporation, Kokomo, Indiana, has prepared a 32-page book of "Practical Plans for Modern Farm Buildings," for which plans are available. Plans were prepared by a farm architect and are accompanied by a bill of materials.

The plan book is a comprehensive manual on the use and application of steel sheets, as well as a catalog of the 17 building plans. Price 50 cents.

◆

258—Hi-Speed Welding

The Electric Controller & Mfg. Co., 2700 E. 79th St., Cleveland, is distributing two leaflets on welding. One, entitled "Hi-Speed Welding with the new EC&M Type LWZ welder contactors" covers heavy-duty magnetic contactors with convenient contact-adjustment, of Line-Arc design. The other covers EC&M weld timers.

Their Bulletin 1201 covers weld timers, while Bulletin 1211 covers welder contactors.

◆

259—New Codes

The National Warm Air Heating and Air Conditioning Association, 5 E. Long St., Columbus, Ohio, recently published the following new codes:

11th Edition—Standard Gravity.....25c each
5th Edition—Practical .....25c each
3rd Edition—Technical .....50c each

Member discount in lots of 1 to 20—40 percent. In lots over 20—50 percent.

◆

260—The Way to Build a House

"This Is the Way to Build a House," by Creighton Peet was intended for children about 6 to 14. The architect is shown as a vital factor and plans eliminating all useless detail fill two pages. The story follows the building of a house from plans to house-warming, and is of interest to adults as well as children. Published by Henry Holt Company, 257 Fourth Avenue, New York City.

◆

261—Measured Oil Heat

Williams Oil-O-Matic Heating Corporation, Bloomington, Illinois, is distributing a 12-page Measured Heat Guide for architects, engineers and builders with suggested specifications; a 4-page folder covering their Hi-Pressure oil burner; and 12-pages entitled "How to Heat Your Home better for less with Measured Oil Heat."

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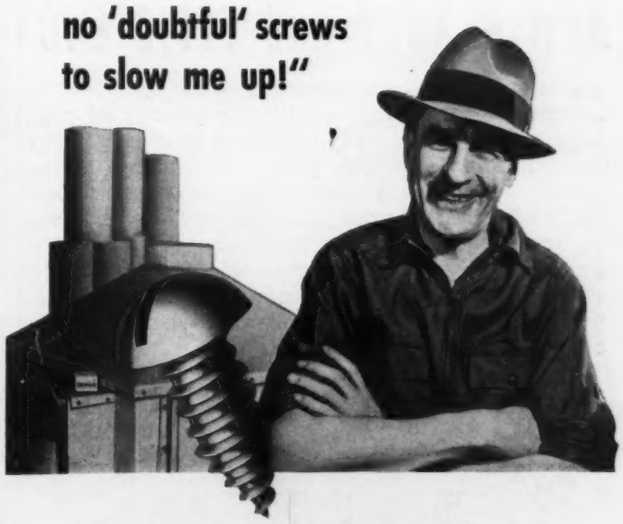

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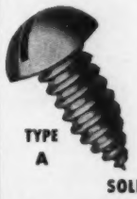

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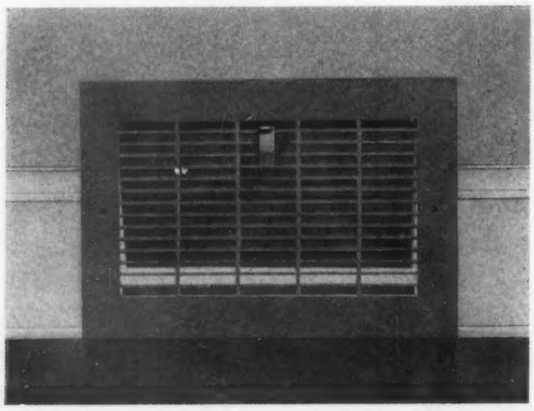
The appearance and performance of your air conditioning, heating and ventilating jobs is of prime importance to you. An inefficient and unattractive installation will work to your disadvantage in both repeat orders and customer's recommendations. Make sure that all your jobs will be a credit to your workmanship and reputation by specifying and installing STANDARD registers. We can supply you with registers, grilles and industrial screens in any quantity and we'll send you a catalog on receipt of your request. Write today.



The new low cost register and grilles are of modern stamped design and perform ideally on warm air heating and air conditioning installations. They are made in all standard sizes with large open area and with a sponge rubber attachment to prevent dust streaks.

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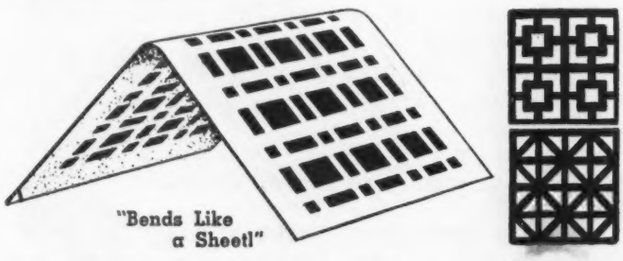

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New Literature . . . .

For your convenience in obtaining copies of new Literature use the coupon on page 89.

262—The Lincoln Weldirectory

Th Lincoln Electric Company, 12818 Coit Road, Cleveland, has published "The Lincoln Weldirectory"—58 pages, 8½ x 11 in., 165 illustrations, including photos and drawings, with cover—printed in two colors.

Procedures for producing all types of welds in mild steel, for welding all metals used to any extent industrially and for applying surfacing metal to meet any type of wear-action in service, are given in this new bulletin.

The procedures, which cover all types of welding, include: recommended current ranges and arc voltages; suggestions regarding arc length, polarity of welding current, distance to hold electrode from work, cleaning beads, welding up or down, use of wide and narrow beads, peening to increase hardness, quenching, weaving the electrode, etc. Properties of welds produced in various metals are given and typical welding applications are illustrated.

A valuable feature is a chart serving as a guide for selection of electrodes for various applications, in addition to a discussion of flat, convex and concave beads. A 2-page illustrated section gives information and pointers on the proper use of modern shielded arc welding. A 10-page section covers the subject of surfacing with arc welding, together with detailed procedures for this branch of welding. Arc welding accessories are illustrated and described in 8 pages of the bulletin.

◆

263—Steel for Modern Living

Carnegie-Illinois Steel Corporation, Room 621 Carnegie Building, Pittsburgh, has published a new 16-page booklet entitled "Steel for Modern Living," illustrated in full color, with separate pages devoted to the bathroom, kitchen, living room, hallway, laundry, recreation room, and exterior of the house. Steel insulation is also pictured and described.

◆

264—Clean Fresh Air

Buffalo Forge Company, Buffalo, is distributing Bulletin No. 3142-A, entitled "Clean Fresh Air" and covering Buffalo air washers, spray conditioning equipment, and a combination of surface cooling with sprays. The company recommends the services of a consulting engineer, however, in the interest of economy and satisfaction.

◆

265—Cooling Towers

Binks Manufacturing Company, 3114 Carroll Ave., Chicago, is distributing Bulletin No. 400, covering their small series self-contained horizontal type induced draft cooling towers, for small and medium capacity self-contained air conditioners and similar equipment. Specifications and capacity tables are included.

◆

266—Advertising Plan of Dealer Helps

Research Products Corp., 1011 E. Washington Avenue, Madison, Wisconsin, offers a complete advertising plan of dealer helps, including post cards, window streamers, radio spots, newspaper ads. The plan promotes the "Fall Furnace Check-Up" idea to increase profits.

◆

267—Moncrief Furnaces

The Henry Furnace & Foundry Co., Cleveland, Ohio, is distributing two 2-page folders covering Moncrief furnaces. One covers the steel furnaces—series D-40, E and DST stoker-fired. The other covers the Moncrief stoker-fired winter air conditioners.

◆

268—Welding, Brazing, Soft-Soldering

The International Nickel Company, Inc., 67 Wall Street, New York City, has revised Technical Information Bulletin T-2 covering welding, brazing and soft soldering of Monel, Nickel and Inconel.

MAID-O'-MIST Humidifiers will evaporate more pounds of moisture per dollar in cost, than other types available. This important fact should be conveyed to every home . . . for every home needs humidity to assure maximum comfort and health to its inhabitants.

CONVECTOR AUTOMATIC HUMIDIFIERS

Maid-O'-Mist Automatic and Drip Convector Humidifiers for Warm Air Furnaces and Floor Furnaces assure ample humidification . . . are easy to install . . . fool-proof in operation . . . last indefinitely . . . and are priced to fit every purse. Made in 18 sizes with single, double and four troughs, and designed to fit straight or sloping fronts, they meet the humidification requirements of the largest or smallest furnace. They are made with either automatic or drip feeds. On the Automatic Convector the Water Feeder is made of Brass, Copper and Monel Metal. The float is made of copper. All are completely nickel plated to avoid the possibility of corrosion. Copper troughs are spaced one inch apart assuring unrestricted air flow through the Patented Metal Edge Replaceable Evaporators. Maid-O'-Mist Automatic and Drip Convector Humidifiers are most efficient, and each installation will make a handsome profit for you. Shipped in compact cartons.

NO. S181

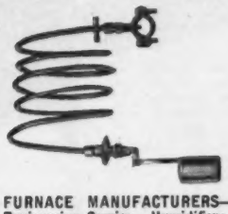
AUTOMATIC HUMIDIFIER NO. 58Z

Meets the demand for a highly efficient humidifier for Winter Air Conditioning Furnaces where lower bonnet temperatures prevail. The 58Z is made of bronze stamped in one piece. Includes Patented Deflector Wings which direct the heated air directly over the water surface assure maximum efficiency. A No. 59 Automatic Water Feeder controls level in pan automatically. Over-Saturation Control permits raising of pan to reduce evaporating area in extreme cold weather. Installation is most simple and pan can be easily removed for cleaning. Comes in two sizes 36 and 26 in. lengths. Also supplied without Deflector Wings.

AUTOMATIC WATER FEEDER NO. 59F

There are handsome profits in converting hand fed pans into automatic humidifiers, with the No. 59F Water Boy Feed Valve. Automatically controls water levels in Humidifiers for all types of warm air furnaces. Easy to install, fool-proof and lasting in action. Built of brass, copper, Monel and nickel silver, avoids the possibility of corrosion. The valve is brass, nickel plated with removable heat and oil resisting incased Neoprene washer. Operation is protected by a Monel metal filter screen. Comes complete ready to install, with 6 ft. of ¼" O. D. copper tubing, and a quick hookup saddle valve. Approved by National Plumbing Laboratory Against Back Siphonage.

NO. 50F WATER BOY MIDGET WATER FEEDER



For bucket or pan type humidifiers. Is 7" long over all. Nickel plated, with replaceable Neoprene washer. Is protected from dirt, pipe scale, etc., by a Monel metal screen. Easy to install. Comes complete with 6 ft. of ¼" O. D. copper tubing and a No. 8 Quick Hook-up Saddle Valve.

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213 NORTH ABERDEEN STREET
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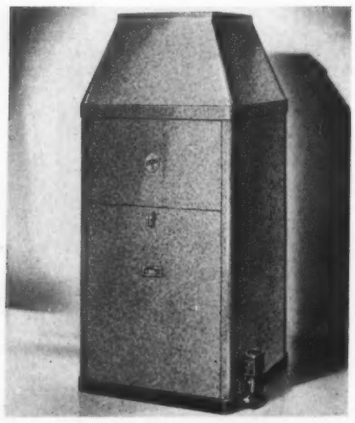
MORE POUNDS PER DOLLAR!

New Products . . . . . .

For your convenience in obtaining information regarding these items, use coupon on page 89.

△236—New Monogram Models

The Quincy Stove Mfg. Co., Quincy, Illinois, makers of Monogram automatic oil furnaces, announces the addition of two new models to its line—the No. 75 Booster gravity unit with an output of 75,000 Btu and the 125.



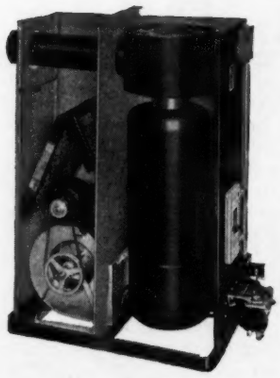
The No. 125 Monogram with an output of 90,000 Btu is smaller than the other two winter air conditioners made by this concern.

237—Improved Comfortrol

Julien P. Friez & Sons, Baltimore, Maryland, announces an improved Comfortrol.

This is actually a humidity-compensated thermostat incorporating a Friez patented multiple human hair

element coupled to a bimetallic temperature element in such a way that the point of dry-bulb control is constantly and automatically varied to suit the existing relative humidity.



•238—Controlled Heat Furnaces

Hoffman Specialty Co., Research Laboratories, Stamford, Conn., offers automatic oil-fired controlled heat furnaces for low-cost homes in two models—basement and utility room.

These units are attractively finished in ivory and brown. Features are a 2-stage flexible-flame fuel-saving burner, mechanical draft, centrifugal type blower, large filters, welded steel combustion chamber, and ground joint cast iron combustion chamber door.

Standard equipment includes assembled unit, completely wired and equipped with combination fan and limit control, burner controls, thermostat, draft regulators and filters.

Bonnet Btu. output per hour for the HB-75—basement unit—is 74,400. For the HU-70 vertical unit, 69,500 Btu.

Maybe you need new sales ammunition?

Don't Let Those Humidifier Sales Get Away, When SKUTTLE Can Help You Get Your Share

The Skuttle Automatic Humidifier Series 200 is 18" to 30" long, 2" deep and 3" wide with ceramics that extend beyond the pan to give proper humidification. Can be easily installed in the plenum chamber of any warm air furnace.

• In hunting, it's as important to bag your bird as it is to flush it out of cover. It's the same in selling—prospects don't mean profits until you actually sell them—and we know it's easier to sell your automatic humidifier prospects if you handle the Skuttle line of automatic humidifiers.

Even furnace manufacturers specify Skuttle Humidifiers as standard equipment on all their warm air furnaces. They know that the home owner is interested in the trouble free operation and the long life of the humidifier he buys as well as the operation of the furnace itself. Our sales promotion helps should interest you too. Why not write today for full information on this profit line.

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Air-Conditioning Equipment

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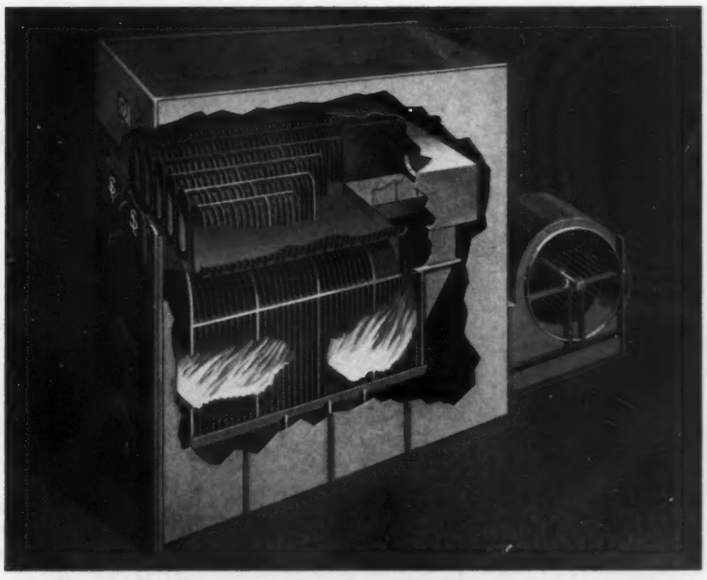
Get in on the BIG work with *Streamline* heaters . . . .

A BIG HEATER . . . FOR BIG WORK: Starting at a point well above the output of the largest residence heaters, STREAMLINE capacities range upwards, single or in batteries, to carry any heating load desired. It is the modern HEAVY-DUTY heater for schools, theatres, factories, hangars, barracks, or ANY building containing large rooms.

Check these features:

1. Heavy cast-iron construction, for long life.
2. "Sealed Heat," for fuel economy.
3. "Streamlined" airflow, for even heat.
4. Air conditioning facilitated.
5. "Free Expansion" . . . improved design.
6. Burns any fuel efficiently.

If the job is to deliver large volumes of evenly-heated air, with minimum fuel consumption and maintenance cost, the STREAMLINE is "the right equipment for the job." Built for long years of trouble-free, heavy-duty performance.



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THERMAL ENGINEERING ASSOCIATES
1618 Northshore Ave., Chicago, Illinois

H&C DAMPER REGULATOR SETS

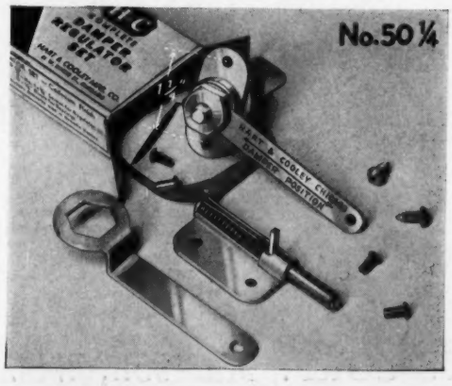
(No. 40¼ S Set with snap bearing is now furnished for No. 40¼ Set at 30c List Price)

ECONOMY TYPE—Quality at a Price!
Furnished with both wing and hexagonal lock nuts. Made only with ¼" Bearings. No. 40¼ S—List Price 30c Set.

Pick the Type that Suits you Best!

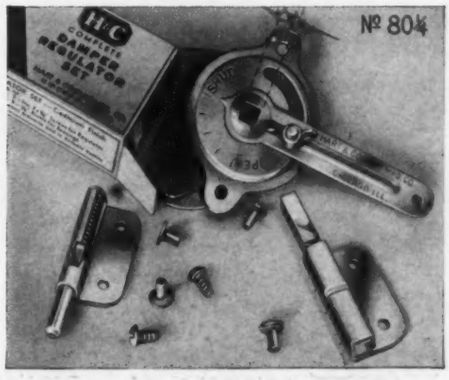
H&C offers three different sets in the ¼" size, all furnished with snap end bearing to permit the installation of even the smallest dampers without bending. All are quality sets in every detail with all parts rust-proofed; all are equally adaptable to splitter or regular dampers. See your Jobber or write for sample and descriptive literature.

HART & COOLEY MANUFACTURING CO.
HOLLAND, MICHIGAN - - Chicago Office at 61 W. Kinzie Street



BRACKET TYPE (left)
With ¼" Bearings. No. 50¼—List Price 40c Set. With ⅜" Bearings. No. 50⅜—List Price 60c Set. ¼" size has snap end bearing.

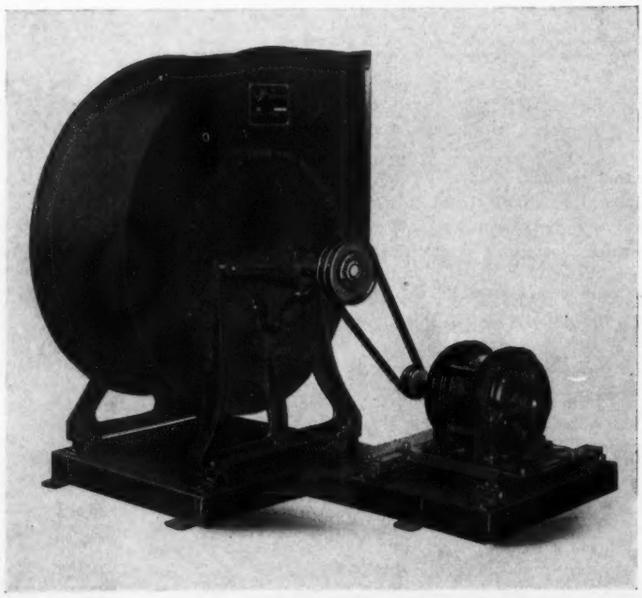
DISK TYPE (right)
With ¼" Bearings. No. 80¼—List Price 40c Set. With ⅜" Bearings. No. 80⅜—List Price 60c Set. ¼" size has snap end bearing.



What! 50 Years to Build This Fan?

Yes, a half-century of fan experience is embodied in today's Buffalo "Limit-Load" Fans. Here's ruggedness of construction combined with refinement of design to provide the ultimate in fan performance. Special features are the Silent Floating Base for extra quietness, and the patented "anti-overload" design which prevents overloading and burn-out of motor.

If you're looking for performance plus in your fan installations, specify QUIET "Limit-Load" Fans. Complete data on request.



BUFFALO FORGE COMPANY
497 Broadway Buffalo, N. Y.
Branch Engineering Offices in Principal Cities
Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

"Buffalo" Limit-Load REG. U.S. PAT. OFF. FAN with Silent Floating Base

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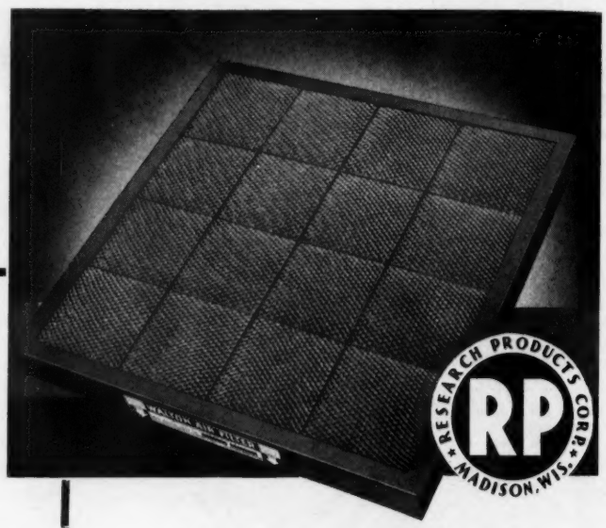
GET IN ON THIS "EXTRA PROFIT" AIR FILTER BUSINESS



RESEARCH (WALTON) AIR FILTER

RESEARCH Air Filters are fast becoming first choice of dealers throughout the country. That's because Research Air Filters are top-notch performers, and because they are easier to service, give LONGER MARGINS to dealers, and provide lower replacement costs to consumers. Now's the time to get in on these EXTRA PROFITS . . . . .

* LONGER MARGINS
* EASIER SERVICE
* *FREE* DEALER HELPS

A complete advertising plan of dealer helps is available, — mailing cards, newspaper ad mats, window streamers, radio spots—write today for complete information, FREE!

Write Today! **RESEARCH PRODUCTS CORP., Madison, Wis.**

New Literature . . . .

For your convenience in obtaining copies of new Literature use the coupon on page 89.

269—Woven Asbestos Flexible Duct Connection

Grant Wilson, Inc., 4101 W. Taylor St., Chicago, offers Bulletin 703 covering the new woven asbestos flexible duct connection for the air conditioning and the sheet metal trade.

270—A Heated Question Answered

Minneapolis-Honeywell Regulator Company, Minneapolis, offers a booklet entitled "A Heated Question Answered," telling a story of fuel saving through control of temperature, based on tests conducted by recognized authorities.

FOR YOUR CONVENIENCE

American Artisan, 6 N. Michigan Ave.
Chicago, Ill.

Please ask the manufacturer to send me more information about the equipment mentioned under the following reference numbers in "New Products" and "New Literature." (Circle numbers in which you are interested):

218	219	220	221	222	223	224
225	226	227	228	229	230	231
232	233	234	235	236	237	238
255	256	257	258	259	260	261
262	263	264	265	266	267	268
269	270					

Name .....

Company .....

Address .....

Are you Manufacturer——Jobber——Dealer——

Statement of the Ownership, Management, Circulation, Etc., Required by the Acts of Congress of August 24, 1912, and March 3, 1933

Of American Artisan, published monthly at Chicago, Ill., for Oct. 1, 1940.

State of Illinois, County of Cook, ss: Before me, a Notary Public in and for the State and county aforesaid, personally appeared F. P. Keeney, who having been duly sworn according to law, deposes and says that he is the business manager of the American Artisan, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:
Publisher, Keeney Publishing Company, Chicago, Illinois.
Editor, J. D. Wilder, Chicago, Illinois.
Managing Editor, J. D. Wilder, Chicago, Illinois.
Business Managers, F. P. Keeney, Chicago, Illinois.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member must be given.)
Keeney Publishing Company, 6 N. Michigan Ave., Chicago, Illinois. Stockholders: F. P. Keeney, Chicago, Illinois; W. J. Osborn, Fairfield, Conn.; R. Payne Wettstein, Chicago, Illinois; Chas. E. Price, Chicago, Illinois; Robert A. Jack, Cleveland Heights, Ohio.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.)
None.

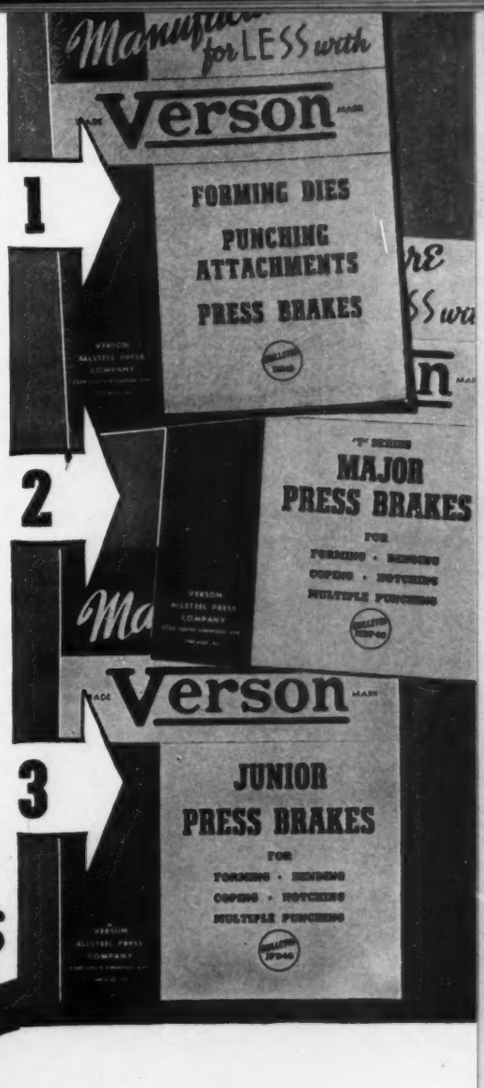
4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the twelve months preceding the date shown above is————. (This information is required from daily publications only.)

F. P. Keeney,
Business Manager.

Sworn to and subscribed before me this 25th day of September, 1940.
(SEAL) Grace E. Waymire, Notary Public.
(My commission expires February 10, 1942.)

You'll want these to help you choose your DIES and BRAKES



1. Verson Die Manual—
2. Complete specifications and
3. details on Verson Major and Junior Press Brakes.

SAVE TIME and send for them TODAY!

FREE To Executives and Engineers

VERSON ALLSTEEL PRESS CO.
9302-A South Kenwood Ave.
CHICAGO, ILLINOIS

Gentlemen:
Please send me your new
☐ Die Manual ☐ Junior Press Brake Bulletin
☐ Major Press Brake Bulletin

Name_____
Company_____
Address_____
City_____ State_____

This motor driven Niagara Combination Machine with interchangeable rolls offers the modern sheet metal worker power operation at a minimum cost. No longer necessary to hold and guide the work with one hand while the other turns the crank. Rotation of rolls is controlled by hand or foot operated clutch. When desired, clutch can be locked for continuous motion. Upper roll may be raised and lowered by foot treadle or crankscrew. Work feeds from left to right.

One machine performs Burring, Turning, Wiring, Beading, Crimping, Elbow Edging, Slitting and other operations. Rolls are quickly interchangeable. Write for Bulletin 75-A. Niagara Machine & Tool Works, General Offices and Factory, 637-697 Northland Ave., Buffalo, N. Y. Branches: New York, Cleveland, Detroit.

Association Activities . . .

Illinois

The Sheet Metal Contractors Association of Illinois will hold their annual convention at Peoria, Illinois, on January 15 and 16, 1941, at the Jefferson Hotel.

Exhibits may be arranged by C. H. Lauerman, 237 East Tompkins St., Galesburg, Illinois.

J. E. Peterson, Hinsdale, Ill.

◆

Chicago

The first fall meeting of the Furnace-Air Conditioning Sheet Metal Institute (on October 24) was an open educational get-together held at Rhineland Hall, Southport & Belmont Avenues, Chicago, devoted to stoker heating.

A. C. Schroeder of Malco Gear Company gave a very interesting talk on merchandising, installing and trouble-shooting stokers, followed by I. B. Brown, heating engineer of Republic Metals, Inc. Both men are practical stoker heating men and the information given should prove helpful and profitable to those handling stokers.

Bill Ufer of Mercoid Corporation will speak on controls at an early future meeting.

Louis Drehobl, President.

◆

Milwaukee

The monthly meeting of the Milwaukee Sheet Metal Contractors' Association on October 7 was called to order by President Angelo Hoffmann.

The Committee on Labor Relations reported on the apprentice situation. The substance of the dissatisfaction seemed to hinge on the 720 days five year basis for the apprentices, the contract reading on a minimum of 400 days. The majority seemed to feel that their obligation towards a 400 day basis for each apprentice was ample and sufficient, although others felt that the 720 days involving approximately $358.00, was well spent for the creation of a mechanic.

The chair called attention to how you can become liable to unemployment tax with less than six employees, and real hazards when workmen are carrying employers tools, etc.

Paul L. Biersach, Secretary.

Coming Conventions

1940

Dec. 10-11—National Warm Air Heating and Air Conditioning Association. 27th Annual. Committee Meetings on the 9th. Hotel Statler, Detroit. George Boeddener, Man. Dir., 5 E. Long St., Columbus, Ohio.

1941

Jan. 15-16—Sheet Metal Contractors Association of Illinois. Annual. Jefferson Hotel, Peoria. (Exhibits—C. H. Lauerman, 237 East Tompkins St., Galesburg.)—J. E. McMackin, Salem, Secretary.

Feb. 4-6—Sheet Metal and Warm Air Heating Contractors Association of Indiana. Annual. Indianapolis. Paul R. Jordan, Exec. Secretary, 631 S. Delaware, Indianapolis.

Feb. 10-12—Sheet Metal Contractors Association of Wisconsin, Inc. Annual. Hotel Pfister. Paul L. Biersach, Secretary.

Mar. 4-6—Michigan Sheet Metal, Roofing, Heating and Air Conditioning Contractors' Association. Annual. Kalamazoo. E. C. Spraker, Secy., 1560 Mackinaw Road, Grand Rapids.

Mar. 17-22—Oil Burner Institute. Exhibition and Annual Convention. Commercial Museum and Benjamin Franklin Hotel, Philadelphia. G. Harvey Porter, Man. Dir., 30 Rockefeller Plaza, New York City.

March—New York State Sheet Metal, Roofing and Air Conditioning Contractors' Assn., Inc. Annual. Hotel Onondaga, Syracuse. Clarence J. Meyer, State Secretary, 567 Genesee St., Buffalo.

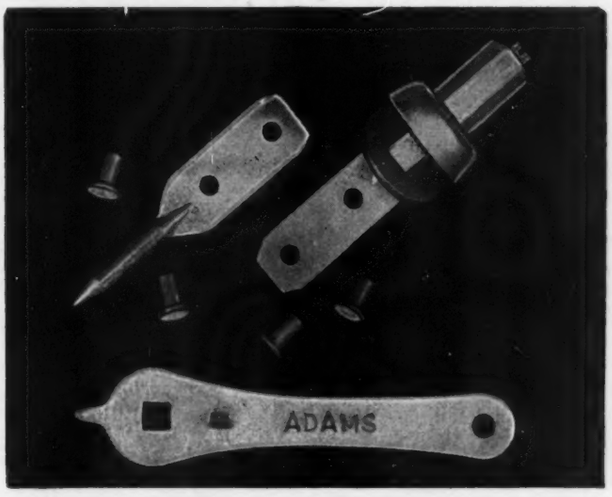
SAL-MO ASBESTOS PRODUCTS

CLEAN-UP time for Warm Air Heating Equipment means many re-cemented and re-insulated Furnaces. With this trio of well known Asbestos Products you can be sure of a repair job or a new installation of Heating Equipment that you can GUARANTEE to do the winter's heating job in a satisfactory manner.

See your nearest jobber. He can furnish you with the proper type of SAL-MO Insulation —Plain and Corrugated Asbestos Papers, Furnace Cements and Pipe Coverings for all uses.

SALL MOUNTAIN COMPANY 176 WEST ADAMS STREET CHICAGO, ILLINOIS

No. 101—¼-inch No. 202—⅜-inch



No. 44—¼-inch No. 33—¼-inch (Without Handle)

ADAMS DAMPER REGULATORS (Cadmium Plated)

The nut on the operating bearing holds the damper blade firmly and securely in position so it will not move or rattle.

Also on the No. 101 and 202 Styles the nut locks the blade in position by keeping the projection on the regulator handle in the desired groove on the dial.

No. 101 and No. 202 Adams Damper Regulator

Consists of

- 1 Dial
- 1 Regulator Handle
- 1 Nut
- 4 Rivets
- 1 Operating Bearing
- 1 Tail Piece Bearing
- 1 Washer
- 2 Sheet Metal Screws

Packed in Individual Packages
No. 101—12 in a box. 12 Boxes (or 144 Regulators) in Carton.
No. 202— 6 in a box. 6 Boxes (or 72 Regulators) in Carton.

No. 44 and *No. 33 Adams Damper Regulator

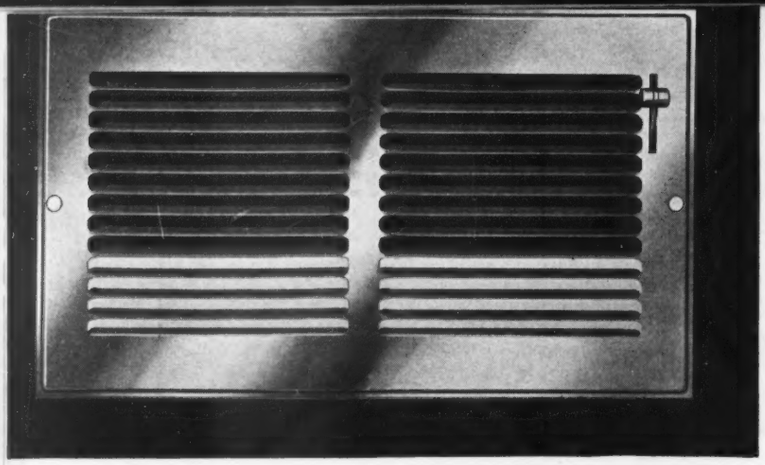
Consists of

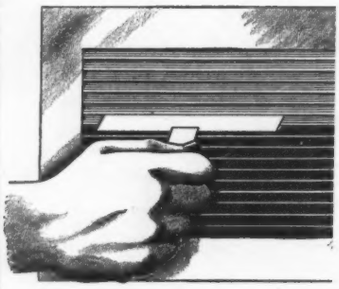
- 1 Operating Bearing
- 1 Tail Piece Bearing
- *1 Regulator Handle
- 1 Nut
- 1 Washer
- 4 Rivets

*1 Regulator Handle, omitted in No. 33

Packed 12 in a box. 12 Boxes (144 Regulators) in Carton.

Manufactured by THE ADAMS COMPANY Dubuque, Iowa, U. S. A.
Established 1883



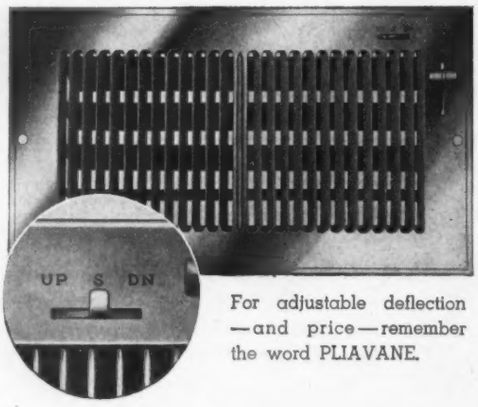


Easy TO ADJUST
Easy TO PAY FOR!
PLIAVANE REGISTER

Here is a modern looking quality-built register with easily adjustable fins for deflection of air any degree up or down that actually costs **less** than a great many registers providing no adjustable feature. With the small tool provided the fins are individually set at any angle in a moment's time. Provides sufficient flexibility for most installations and keeps costs way down.

ALSO IN AN ADJUSTIBLADE TYPE

The Pliavane Register is also offered in the famous Adjustiblade Type for complete flexibility. Provides sidewise deflection of the air as well as up and down. The price is less than you have been used to paying for many standard single valve registers.



For adjustable deflection —and price—remember the word PLIAVANE.

T & B TUTTLE & BAILEY, Inc.
NEW BRITAIN, CONN.
NEW YORK CHICAGO PHILADELPHIA

With the Manufacturers . .

Marr General Sales Manager Airtemp

D. W. Russell, president, Airtemp Division of Chrysler Corporation, Dayton, Ohio, announces the appointment of Earl Marr as general sales manager of the Airtemp Division.

Mr. Marr, has been sales manager of the heating division of Airtemp since November, 1939.

◆

Congress Die Casting in New Plant

The Congress Die Casting Division of Congress Tool & Die Company, Detroit, has moved into their new plant at 3760 East Outer Drive. The new factory is fully

equipped with the latest, most modern equipment.

Herman Tann, general manager, reports an increase in orders for both standard Congress drives and custom die casting.

◆

New Plant for Utility Fan

Utility Fan Corporation, Los Angeles, is distributing a folder showing their new Los Angeles plant, the fourth large expansion in ten years. The new plant takes the place of the six separate factory buildings in which Utility gas appliances, blowers and coolers have been produced.

The new Utility plant is a 3-story building, with approximately three acres of floor space, at 48th and Alameda Streets, Los Angeles. Adjoining the present plant, the company owns more than an acre of ground for further expansion when required. There is a private railroad spur tract for receiving and shipping carloads.

Utility's new factory is a Class A, reinforced concrete structure, with complete sprinkler fire protection. The building is air-cooled, as well as heated, and equipped with every modern convenience.

The new building houses general offices, laboratories, engineering staff, and shipping department, as well as the large manufacturing divisions.

◆

Matheson Rejoins Williams Oil-O-Matic

W. W. Williams, President Williams Oil-O-Matic Heating Corporation, Bloomington, Illinois, announces that W. A. Matheson has rejoined the company in the newly established post of assistant to the president.

Since February, 1937, Mr. Matheson has been in charge of the New York office for the Delco Heat Division of General Motors Sales Corporation. Previous to his General Motors connection. Mr. Matheson had spent more than ten years in various Williams Oil-O-Matic activities.

With the Manufacturers . .

Allegheny Ludlum Pacific Coast Warehouse

Allegheny Ludlum Steel Corporation, 2319 Oliver Building (22), Pittsburgh, announces the construction of a new warehouse situated on Pacific Boulevard, Los Angeles. The new building will be a concrete industrial building, and is necessitated by the growing business of the corporation on the Pacific Coast and the continued increasing demands for its alloy and special steels.

◆

New York District Sales Manager

Inland Steel Company, 38 South Dearborn Street, Chicago, announces the opening of a New York district sales office on November 1, with Powell Pardee as district sales manager. The office will be located at 40 Wall Street.

Mr. Pardee has been with the company since 1905 and was manager of the order department in Chicago from 1913 to early in 1940. About six months ago he was sent to New York as a special representative, in connection with export.

The New York Office will handle both export and domestic business in the eastern territory.

◆

Mendell Debothezat General Sales Manager

American Machine & Metals, Inc., East Moline, Illinois, announces the appointment of Wayne Mendell as Acting General Sales Manager of all divisions of that company, including the DeBothezat Ventilating Equipment Division.

Mr. Mendell has been in charge of the company's central sales region and now moves to the headquarters office at East Moline, where he will be actively associated with C. W. Anderson, sales manager of DeBothezat.

◆

McNerney Joins Armstrong Company

The Amstrong Company, 241 South Post Street, Detroit, manufacturers of plastic cements putties and specialties, announces the appointment of F. M. McNerney as technical director of their Detroit, Chicago and Dallas plants.

Technical headquarters will continue at the Detroit plant, where the laboratory is being enlarged.

◆

Conway Celebrates Diamond Anniversary

Wm. A. Conway, Incorporated, Baltimore, distributors of a complete line of warm air furnaces, air conditioning, registers, heating equipment, sheet metal, roofing, ventilators and many other products incidental to the roofing and sheet metal business, is celebrating its diamond anniversary this year. The institution was begun in 1865—the last year of the civil war—when Baltimore was slowly growing into a city of homes and healthy business.

Wm. A. Conway, president of the firm, is assisted in the operation of the firm by his three sons—Raymond A., Charles Leo and William A. Another son, Charles B., is an attorney, and also counsel for the firm.

Wm. A. Conway has begun his fourth quarter of the first century of his business.

◆

New Agents for Spraying Systems

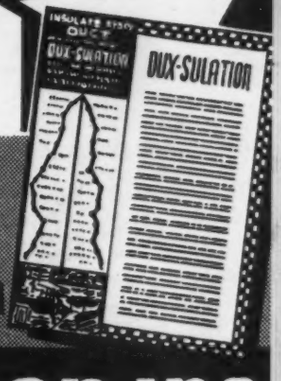
Spraying System Co., 4021-F W. Lake Street, Chicago, announces two new agents in the East:

F. R. Magill, 1807 First National Bank Bldg., Pittsburgh, will represent the company throughout Western Pennsylvania and in the neighboring steel districts of Ohio and West Virginia. Also recently appointed is the Manufacturers' Supply Co., 1201 C Street, N.E., Washington, D. C.

IT'S A *Smart Move*
TO INSULATE DUCTS WITH
DUX-SULATION

Saves 75% of the Heat Loss. K .27 B.T.U.	**High Sound Absorption. 70% in less than 10 lineal feet.**	Balances job. Saves Fuel. Quiets Noises.
Fire-Safe with Asbestos Protection built in.	Made especially for Air Conditioning, Ventilating and Warm Air Industries.	**Prevents Condensation, Duct Sweating, and Duct Rust.**
Inexpensive to use. No material waste. Built to last and stand hard usage.	**Moisture proof Surface. Mildew proof Treated. No rotting or chipping.**	Convenient to handle in stock or on job. Roll contains 100 square feet.
Standard 1/2" thickness is right thickness for most jobs.	Easiest insulation to apply and looks best.	**Low frictional resistance. Smooth surface.**
Can be applied on inside or outside of round or rectangular ducts.	**Comes Complete, ready to apply. No extras to buy.**	

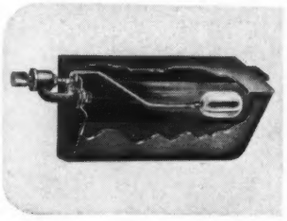
Free BULLETIN No. 404



YOUR COPY OF THIS VALUABLE BOOK ON CORRECT DUCT INSULATION IS READY.
WRITE FOR IT TODAY!

GRANT WILSON INC
4101 TAYLOR STREET CHICAGO, ILLINOIS

FOUR GOOD REASONS WHY M-VB #300



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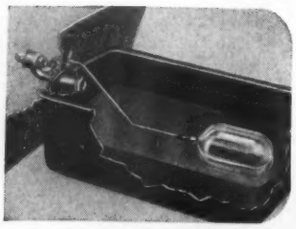


M-VB #305

HUMIDIFIER VALVES are "TOPS"!

They lick corrosion troubles. These humidifier valves have the valve mechanism mounted *outside* the furnace or air-conditioning unit. And they also have that important, exclusive M-VB feature, the *Pyrex Glass Float.*

Quality Construction. #300 and #305 are M-VB throughout—and that tells the story. Heavy brass castings. Accurate machining. Big enough for their job all the way through.

Economy. Lowest first-cost in the Field for valves with outside working parts. And virtually no maintenance expense.

Quiet operation. These valves have large passageways that insure minimum water-rush and splashing even under relatively high water pressure.

If you're in the business of making—selling—or installing warm air furnace or air-conditioning equipment, it'll pay you to get fully acquainted with these new and better humidifier valves right away. Get in touch with your manufacturer or M-VB.

M-VB MORENCY-VAN BUREN DIVISION
SCOVILL MANUFACTURING CO.
Sturgis, Michigan

SCOVILL SAVES YOU TIME IN SELLING—TIME IN INSTALLING

Complete lines of humidifier valves maintained at Waterville, Connecticut — San Francisco and Los Angeles, California

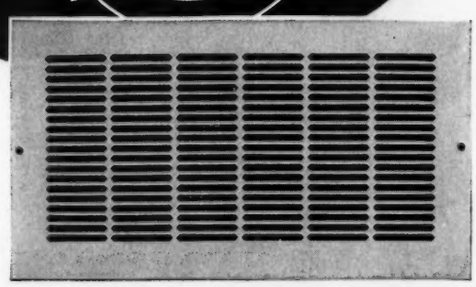
Arnold Kruckman's Washington Letter

(*Continued from page* 30)

officers' quarters, supply rooms, administration buildings, fire stations, guard house, hospital, post exchange, repair shop, utility shop, recreation building, telephone building, theater, warehouses, operations buildings, radio station, control tower, air corps shop, miscellaneous storage buildings, link trainer building, parachute building, school building, magazines, and the usual fringe housing for civilians and soldiers.

Constructing Quartermasters, who can discuss details of all jobs, are now located at the following places: **Arizona:** Ft. Huachuca; **Arkansas:** Army & Navy General Hospital, Hot Springs; **California:** Sacramento Air Depot, Sacramento; San Francisco: Ft. Mason; March Field, Riverside; **Canal Zone:** Quarry Heights; **Colorado:** Ft. Logan; Lowry Field; Denver; Fitzsimons Hospital, Denver; **Delaware:** Ft. Dupont; **Florida:** Ft. Barrancas; **Georgia:** 1306 Twenty-Two Marietta Building, Atlanta; Ft. Benning; Ft. McPherson; **Hawaii:** Hawaiian Department, Honolulu; Ft. Shafter; **Illinois:** 1819 W. Pershing Road, Chicago; Chanute Field, Rantoul; Ordnance Depot, Savanna; Scott Field, Belleville; Ft. Sheridan; **Indiana:** 10th Street & Meigs Ave., Jeffersonville; Ft. Benj. Harrison; **Kentucky:** Ft. Knox; Ft. Thomas; **Kansas:** Ft. Riley; **Louisiana:** Barksdale Field; **Michigan:** 611 Federal Building, Detroit; Ft. Brady; Ft. Wayne; **Massachusetts:** Boston Army Base, Boston; Ft. Devens; **Maryland:** Holabird QM Depot, Baltimore; **Missouri:** 2nd & Arsenal Street, St. Louis; Jefferson Barracks; **Montana:** Ft. Missoula; **Minnesota:** Ft. Snelling; **New Jersey:** Ft. Hancock; Ft. Monmouth; Ft. Dix; **Delaware:** Ordnance Depot, Pedricktown; **North Carolina:** Ft. Bragg; **Nebraska:** Ft. Crook; **New York:** First Ave. and 58th Street, Brooklyn; 90 Church Street, New York City; Madison Barracks, Mitchel Field; Ft. Niagara; Plattsburg Barracks; West Point, Schenectady

Waterloo REGISTERS



New! Low Cost!

R-600 SERIES

• A new quality-built Waterloo Register, specially designed for use in low cost homes. R-600 Registers provide many construction features found in higher priced registers—yet are offered at the very lowest prices. Complete range of sizes and finishes for every requirement. Baseboard and wall types.

WATERLOO REGISTER COMPANY
WATERLOO, IOWA SEATTLE, WASH.
Representatives in Principal Cities

General Depot; **Oklahoma:** Ft. Sill; **Ohio:** Wright Field, Dayton; **Pennsylvania:** 21st and Johnston Streets, Philadelphia; Carlisle Barracks; Connellsville Air Depot, Connellsville; Middletown Air Depot, Middletown; New Cumberland General Depot; **Puerto Rico:** Port of San Juan; **Texas:** Normoyle QM Depot, San Antonio; Ft. Crockett; Ft. Bliss; Ft. Sam Houston; Ft. D. A. Russell, Marfa; **South Carolina:** Ft. Moultrie; **Vermont:** Ft. Ethan Allen; **Virginia:** Langley Field; **Utah:** Ft. Douglas; Ordnance Depot, Ogden; **Washington:** Ft. Lewis; McChord Field; Vancouver Barracks; **Wyoming:** Ft. F. E. Warren.

The projects enumerated hereafter are built by Government or under direct Government control, unless marked *.

ALABAMA: Anniston, housing; **Ft. McClellan,** miscellaneous buildings; **Montgomery,** housing; **Selma,** *housing; **Chickasaw,** Navy shipbuilding plant structures, *housing; **Dauphin,** *industrial buildings, *housing; **Mobile,** southeast Army Air Depot structures, housing; **Calhoun County,** (10,640 acres) ammunition storage depot buildings; **Gadsden,** shell plant covering 150 acres; **Birmingham,** industrial buildings, housing; . . . **ALASKA: Anchorage,** vast Army building operations; **Fairbanks:** numerous Army Air Corps buildings; **Pt. Campbell,** numerous buildings for Army and Navy; . . . **ARKANSAS: Camp Joseph T. Robinson,** $5,000,000 schedule of buildings; **Little Rock,** army and industrial buildings; **Jonesboro,** *industrial buildings, *housing; **Rogers,** *industrial structures, *housing; **Hot Springs,** Army buildings; . . . **ARIZONA: Ft. Huachuca,** housing, hospital, quarters, barracks, other buildings; **Ft. Tuthill,** housing; **Tucson,** housing, Army structures.

CALIFORNIA: Berkeley, housing; **Monterey,** Army structures, housing; **Camp McQuade,** housing; **Camp Paso Robles,** buildings, housing; **Salinas,** *housing; **Santa Monica,** *plant expansion, airport building; Army buildings, housing; **Ft. Ord,** housing, buildings; **Camp Merriam, San Luis Obispo,** $4,000,000 building program, hous-

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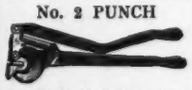

Length — 23 inches. Capacity — ⅜-inch hole through ⅛-inch iron. Punches and dies in sizes ⅜-inch to ½-inch by 64ths.

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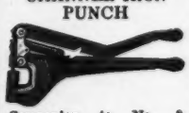

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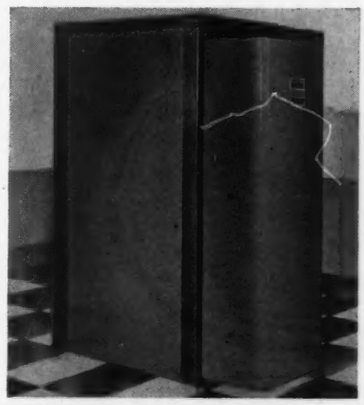

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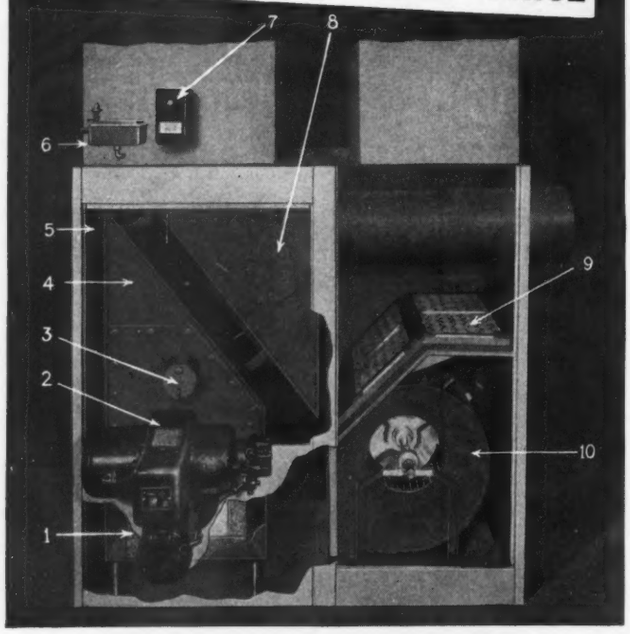

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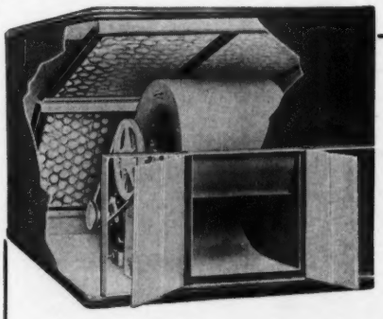
ing; **March Field,** huge building expansion; **Stockton,** Army, and Army Air Corps buildings, housing; **San Rafael,** housing, air corps structures; **Fresno,** housing, air corps structures; **Inglewood,** *plant expansion, *housing; **Benicia,** arsenal buildings, Army structures, housing; **San Pedro,** $40,000,000 Navy building program; **San Jose,** Air Corps buildings, hangars, housing; **Tiburon,** Naval Net Depot buildings; **Sunnyvale,** air corps structures, experimental laboratories, housing; **Riverside,** offices for Army, quarters, housing; **Moffett Field,** airfield structures; **Mare Island,** navy buildings, housing; **Vallejo,** $3,000,000 housing program; **Los Angeles,** airport army structures; L. A. Shipbuilding structures; Bethlehem Steel building program; Navy storage buldings; **San Diego,** Army and Navy buildings, housing for 40,000; **San Francisco,** Lettermann General Hospital warehouses, Port of Embarcation warehouses, steel plant, ship yard, housing; **Downey,** *plant expansion, *housing; **Burbank,** *plant expansion, *housing; **Sacramento,** Army and Air Corps buildings; **San Clemente Island,** Navy structures; **Oakland,** Naval Supply depot storehouses, storage buildings; **Muroc Lake,** air depot barracks, hangars, etc.; **Hamilton Field,** housing; **Ft. Mason,** barracks; **Santa Barbara,** air depot buildings; **Alameda,** air depot buildings, housing, industrial plants; **Mather Field,** buildings; **Ft. Rosecrans,** barracks; **Ft. Elliott,** buildings, utilities; **Reeves Airfield,** buildings; **Long Beach,** air depot buildings, navy structures, housing; **Terminal Island,** navy structures; **Ft. McArthur,** barracks; **Presidio of San Francisco,** building; **Ft. Winfield Scott,** warehouses; **Ft. McDowell,** barracks; **Presidio of Monterey,** buildings; **Hearst Ranch,** (154,000 acres) conversion to Army uses with numerous buildings.

CANAL ZONE: **France Field,** quarters; **Ft. Kobbe,** misc. buildings; **Ft. Clayton,** misc. buildings; **Albrook Field,** hangars, buildings; **Corozal,** officers' quarters; **Coco Solo,** apartment building, housing, buildings for Navy; **Mt. Hope,** office quarters; **Howard Field,** hangars; **Bruja Point Field,** buildings; **Camp Rio Hato,** barracks, buildings; **Ft. Sherman,** barracks; **Ft. William D. Davis,** quar-



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COLORADO: Lowry Field, hangars, barracks, quarters, shops, buildings, housing; **Pueblo,** *plant expansion, *housing; **Burlingham,** industrial building; **Denver,** industrial buildings, Army structures, housing; . . . **CUBA: Guantanamo Bay,** storehouses, barracks, hangars, buildings. . . . **DISTRICT OF COLUMBIA: Anacostia,** Navy buildings; **Washington,** Navy and Army buildings; **Bolling Field,** hangars, quarters, offices. . . . **DELAWARE: Georgetown,** industrial buildings; **New Castle,** industrial structures; **Ft. Dupont,** housing; **Delaware City,** housing.

FLORIDA: Camp Blanding, $10,000,000 building program; **Orlando,** Air Corps shops, housing; **MacDill Field,** buildings and utilities; **Pensacola,** Navy air buildings, housing; **Tallahassee,** housing; **West Palm Beach,** housing; **Tampa,** housing; **Key West,** marine barracks; **McCoy Field,** building, housing; **Jacksonville,** Navy aviation buildings, housing; **Jupiter,** *industrial plants, housing; **Ft. Pickens,** buildings; **Ft. Barrancas,** Air Corps hangars, shops, buildings, housing; **McCorry Field,** buildings; **St. Augustine,** industrial building; **Winterhaven,** housing; **St. Petersburg,** industrial building; **Daytona Beach,** air facilities; **Palatka,** industrial building; **Sarasota,** housing; **Lakeland,** Government building; **Panama City,** Navy structures; **Avon Park,** housing; **Opa Loucka Air Station,** buildings; **Valparaiso,** buildings; **Banana River,** Navy base buildings; **Miami,** industrial, air, Army, Navy buildings, housing. . . . **GEORGIA: Camp Savannah,** Air, Army, $3,000,000 building program; **Atlanta,** Army General Depot, naval air base structures; **Augusta,** housing; **Savannah,** housing; **Columbus,** 2,000 housing program; **Rossville,** housing; **Hinesville,** anti-aircraft training cen-

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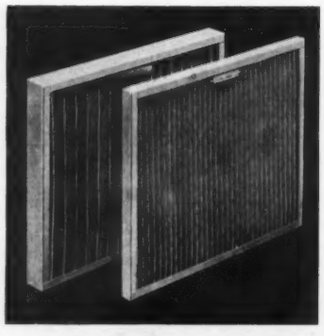

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ILLINOIS: Ft. Sheridan, housing; **Belleville,** Air Corps school, field, buildings, barracks, housing; **Savanna,** ammunition plant, buildings, barracks, housing; **Rantoul,** Air Corps school, barracks, housing; **Great Lakes Naval** Training Station, temporary building; **Rock Island,** arsenal, housing; **Chicago,** industrial plant expansions; **East Alton,** ($100,000,000 small arms industry) expanded plants, housing; **Wilmington,** $20,000,000 powder plant, housing; **Kewanee,** plant expansion; **Scott Field,** housing; **Springfield,** industrial plants; **Moline,** industrial plants; **Waukegan Naval Training Station,** buildings; . . . **KANSAS: Ft. Riley,** barracks, offices, housing; **Wichita,** $4,000,000

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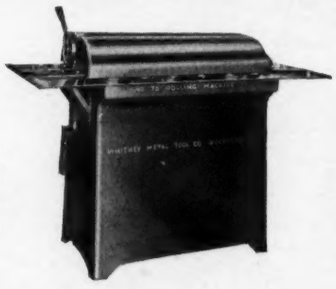

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MAINE: Bangor, plants, housing; **Bath**, $2,000,000 Navy shop buildings, Bath Iron Works plant expansion, housing; **Ft. Levitt**, utilities; **Portland**, industrial plants; **Augusta**, business structures; **Ft. McKinley**, housing; **Ft. Williams**, housing; **Presque Isle**, Navy buildings; **Ft. Preble**, barracks; **Brunswick**, industrial plant; . . . **MARYLAND: Annapolis**, $1,000,000 building program; **Frederick**, Air Corps Station, buildings; **Camp Chesapeake Bay**, full building program; **Indian Head**, Navy industrial structures, housing; **Aberdeen**, $6,000,000 Navy munitions plants, testing ground building, housing; **Edgewood**, housing; **Baltimore**, plant expansions, $4,000,000 Navy buildings, housing; **Odenton**, housing; **Ft. George G. Meade**, $8,000,000 camp building operations; **Ft. Hoyle**, buildings; **Ft. Washington**, buildings; **Ft. Howard**, buildings; **Hagerstown**, *plant expansion, *housing; **Holabird Army Depot**, buildings; **Carderock**, industrial plant; **Sparrows Point**, ship building plant; . . .

MASSACHUSETTS: Fallmouth, Mass. Military Reservation, buildings; **Ft. Devens**, $9,000,000 worth of structures, for 20,000 troops, housing; **Chicopee**, housing; **Quincy**, housing, ship and steel, *industrial plants; **Springfield**, armory; **Camp Edwards**, principal New England cantonment, $8,000,000 building program; **Indian Orchard**, housing; **Holyoke**, industrial building; **Hingham Naval Depot**, building; **Hudson**, business structures; **Westover Field**, buildings; **Brockton**, industrial structures;

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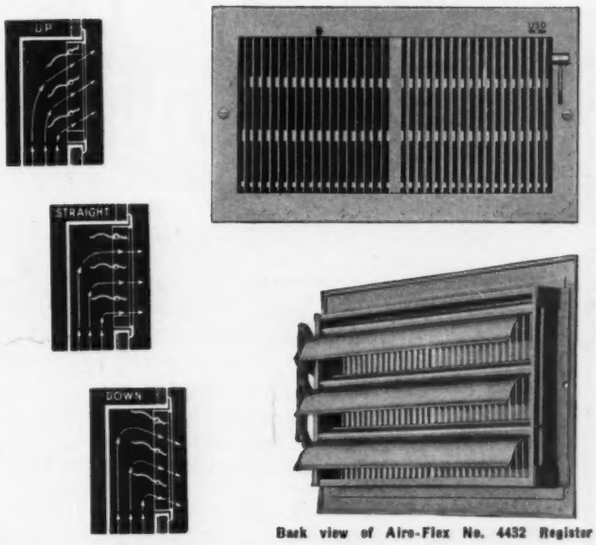

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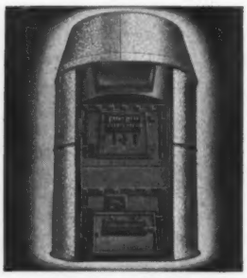

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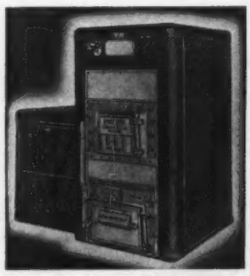

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MINNESOTA: Ft. Snelling, buildings; **Duluth,** industrial and marine structures; **Hibbing,** industrial plant; . . . **MISSOURI: Jefferson Barracks,** barracks, offices, misc. structures; **Sedalia,** industrial buildings; **Kirksville,** aviation structures; **Robertson,** *plant expansion, *housing; . . . **MISSISSIPPI: Jackson,** housing; **Camp Shelby,** buildings, housing; **Camp Meridian,** Air Station hangars, quarters, misc. buildings; **Pascagoula,** industrial plant, *housing; **Vicksburg,** industrial buildings; **Hattiesburg,** business structures, *housing. . . . **MICHIGAN: Selfridge Field,** 83 buildings, $1,000,000 program; **Grosse Isle,** Naval Reserve Aviation Base, alterations to many buildings; **Pontiac,** industrial plant, *housing; **Muskegon,** *industrial structures, *housing; **Camp Custer,** added buildings of miscellaneous uses; **St. Joseph,** *plant for munitions, housing; **Battle Creek,** housing; **Mt. Clemens,** housing, Air Station buildings; **Detroit,** industrial buildings; **Bay City,** miscellaneous industrial structures; **Saginaw,** industrial buildings, air depot buildings; **Grand Rapids,** industrial structures, *housing; **Hillsdale,** industrial buildings; **Flint,** *housing, industrial buildings; **Alpena,** industrial buildings; **East Jordan,** industrial structures; **Ft. Brady,** barracks, offices, warehouses; . . .

NEBRASKA: Ft. Crook, barracks, quarters, other buildings; **Ft. Omaha,** various buildings; **Ft. Robinson,** misc. buildings; . . . **NEW JERSEY: Camp Dix,** 880 buildings, to cost $8,000,000 when finished; **Camden,** $3,000,000 additional ship plants, machine tool plants, housing, air depot buildings; **Kearny,** ship plants, various machine plants, (one of the largest industrial

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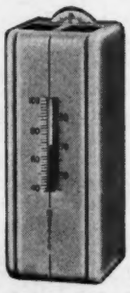

You can feel confident of winning the good will of your customers, when you sell and install the

MASTER

HEAT REGULATOR TYPE A-23

This positive, snap action regulator operates on a differential of only ½ degree. Accurate, dependable, low cost, it will outlast the heating plant itself. Operates quietly, surely, and safely—to the complete satisfaction of the most exacting user. Write us today for Bulletin giving complete information on the Master line.

Makers of Dependable Regulators for Over 20 Years

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centers on the Atlantic coast); **Ft. Monmouth,** housing; **Long Branch,** housing; **Paterson,** *plant expansion, housing; **Picatinny,** arsenal, many buildings; **Newark,** housing, industrial buildings; **Bayonne,** $7,000,000 ship building plants, housing; **Naval Supply Depot,** $5,000,000 for buildings and facilities; **Belleville,** industrial buildings; **Bloomfield,** industrial structures; **Atlantic City,** air field and industrial structures; **Lake Denmark,** Navy factory; **Rahway,** industrial building; **Camp Sea Girt,** various buildings; **Lakehurst Naval Air Station,** buildings, housing; **Ft. Hancock,** barracks, offices; **Raritan,** industrial buildings; **Bendix,** factory buildings; **Pedricktown,** munitions factories; **Metuchen,** industrial buildings; . . . **NEVADA: Hawthorne,** Naval ammunition depot buildings, $2,146,000 program; **Boulder Dam,** army defense works; . . . **NEW MEXICO:** Albuquerque, Army air depot structures, housing; **Las Vegas,** military structures; **Roswell,** air depot structures; . . .

NEW YORK: Buffalo, industrial plants, housing; **Farmingdale, Long Island,** industrial buildings, housing; **Fishers Island Village,** housing; **Hempstead,** housing; **Staten Island,** $3,000,000 Navy building program, Steel plant expansion; **Mitchel Field,** buildings; **Ft. Ontario,** housing; **Brooklyn,** Navy yard structures, *plant industrial structures, *housing; **Schenectady,** *plant expansion, *housing; **Watervliet,** arsenal, housing; **Rochester,** *plant expansion, *housing; **Utica,** $50,000,000 plant expansion; **Ft. Jay,** housing; **Camp Upton,** buildings, housing; **Ft. Wadsworth,** housing; **Plattsburgh Barracks,** various buildings; **Madison Barracks,** buildings; **New York City,** $12,000,000 Navy harbor construction of buildings; **Pine Camp Barracks,** $6,000,000 building program; **Iona Island,** Navy buildings; **Camp Sandy Hook,** buildings; **Ft. Schuyler,** misc. buildings; **Syracuse,** *plant expansion, *housing; **Ft. Totten,** barracks, warehouses; **Ft. Tilden,** building; **Miller Field** (New York City), air depot buildings; **Stewart Field** (Newburgh), air depot buildings; **Ft. Slocum,** various structures; **Ft. H. G. Wright,** buildings; . . .

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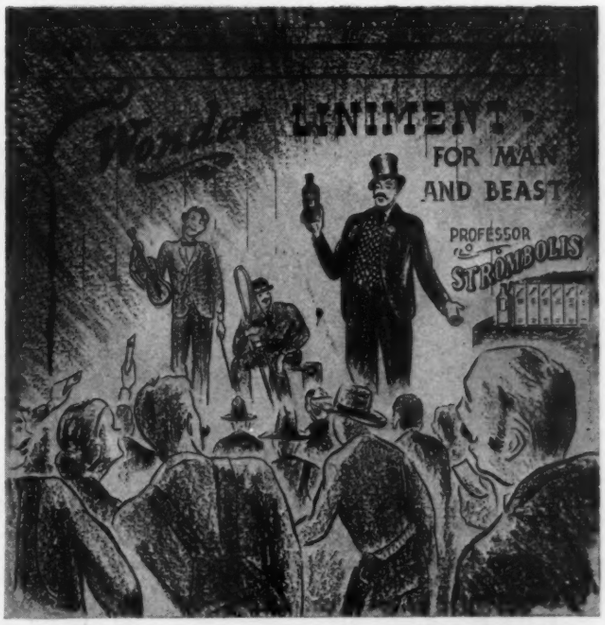

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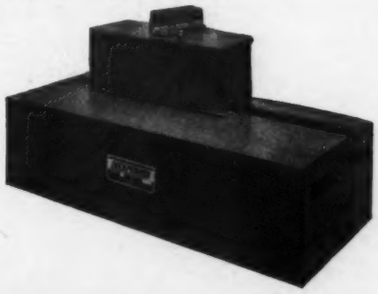

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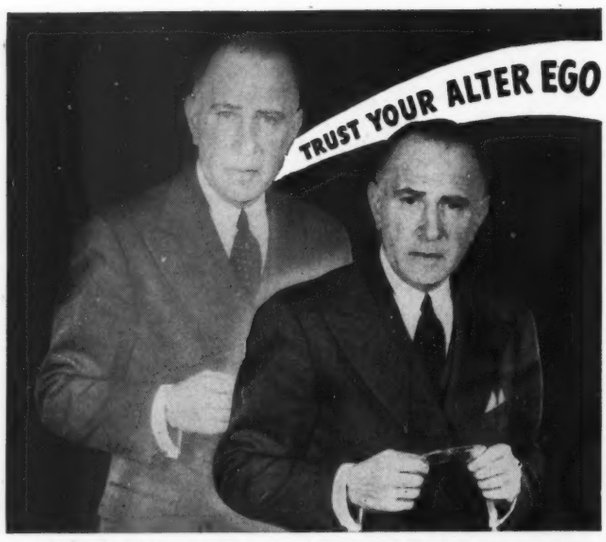

ALTER EGO: Literally "one's other self"— the still, small voice that questions, inspires and corrects our conscious action.

ALTER EGO: Let's talk things over. As your other self, I feel it my duty to give you some advice on how to improve your product and cut its cost.

Well, you're one fellow I don't mind getting advice from. I know you *won't try to sell me something.*

ALTER EGO: All right. Here's my suggestion. First, improve your reasoning technique. Learn to *trust your Alter Ego.* Listen to that inner voice more often.

All right, but I've had to use my conscious mind so much to ward off exposure to arc welding salesmen that I've got in the habit of trusting my surface judgment.

ALTER EGO: Yes, and because of surface reasoning you're too prone to deride that which you don't sufficiently understand. Look how others are profiting with arc welding.

But how can I understand arc welding without opening up to sales exposure?

ALTER EGO: I understand that Lincoln is a good source for arc welding information that's devoid of your pet aversion. Not a high-pressure sales talk in a book-full.

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LINCOLN SUGGESTS: To better acquaint yourself with arc welding procedure, why not obtain an informative discussion of this metal working process as applied to *your* problems? Lincoln's booklet, "101 Welding Ideas" gives the facts.

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Largest Manufacturers of Arc Welding Equipment in the World

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OREGON: Ft. Stevens, temporary buildings; **Columbia,** housing, military structures; **Tongue Point Naval Station,** misc. buildings; **Astoria,** business structures, military buildings; . . . **PENNSYLVANIA: Williamsport,** industrial buildings, *housing; **Indiantown Gap,** Cantonment, $6,000,000 job of buildings; **Philadelphia:** Naval aircraft factory, Navy Yard buildings, Marine Corps Supply Depot, QM warehouses, $1,000,000 armor plate plant, housing; **Titusville,** machine tool plants, housing; **Beaver County,** steel mill expansion, housing; **Pittsburgh,** steel mill addition $3,000,000; **Harrisburgh,** Air Corps Station, buildings; **Frankford,** Arsenal, various new buildings; **Bethlehem,** additions to steel plants, machine tool plants; **Irvine,** industrial buildings; **Erie,** industrial buildings; **Nicetown,** industrial buildings; **Ardmore,** industrial buildings; **Pottstown,** business buildings; **Middletown Air Depot,** hangars, barracks, etc.; **Danville,** industrial buildings; **Berwick,** industrial buildings; **Youngwood,** industrial

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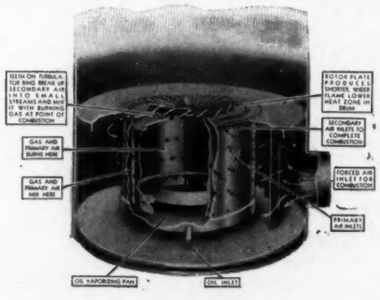

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MONOGRAM features this burner in all of its oil heating units (space heaters and automatic warm air furnaces) and has obtained the highest known operating efficiency. For information about trouble-free oil heating service that can be operated at a lower cost—WRITE US TODAY.

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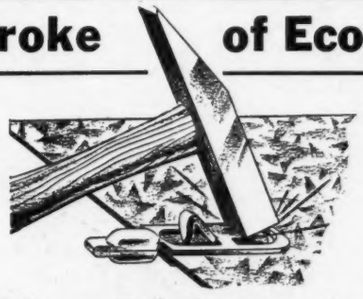
PUERTO RICO: Vega Baja, military buildings; **Dorado,** military buildings; **Mayaguez,** military buildings; **Santa Isabel,** military buildings; **Salinas,** military buildings, housing; **Ft. Buchanan,** barracks, offices, quarters; **Camp Arecibo,** full camp building complement; **Camp Juana Diaz,** complete camp building group; **Ft. Cristibal,** barracks, warehouses, etc.; **San Juan,** naval and military structures; **Borinquen Field,** hangars, shops, quarters, etc.; . . . **PHILIPPINES: Camp John Hay,** barracks, warehouses; **Ft. Mills,** warehouses, quarters, etc.; **Corregidor,** military structures; **Pettit Barracks,** various modernized buildings; **Ft. Stotenburg,** barracks, mess halls, warehouses; **Pampagna,** air depot buildings; **Nichols Field,** hangars, shops, etc.; . . .

RHODE ISLAND: Newport, naval housing; **Camp Narragansett,** army barracks, buildings, warehouses, etc.; **Quonset Point,** Navy station buildings; **Warwick,** industrial buildings; **Ft. Adams,** barracks, warehouses, shops, quarters, etc.; . . . **SAMOA: Tutulla,** medical military buildings; . . . **SOUTH CAROLINA: Camp Columbia,** mess halls, hospitals, barracks, quarters, etc., housing; **Charleston,** Navy yard buildings, housing; **Ft. Jackson,** various Army buildings, $4,000,000 program; **Parris Island,** Marine Barracks, housing; **Ft. Moultrie,** barracks, warehouses, housing; . . . **SOUTH DAKOTA: Ft. Meade,** various Army structures, housing; . . . **TENNESSEE: Tullahoma,** Camp Peay, $9,000,000 building operation, housing; **Chattanooga,** Army structures, *plant expansion, *housing; **Memphis,** air depot buildings; **Jefferson City,**

A Stroke of Economy



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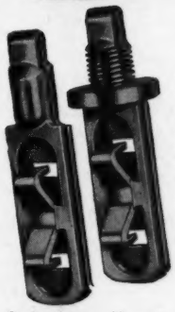

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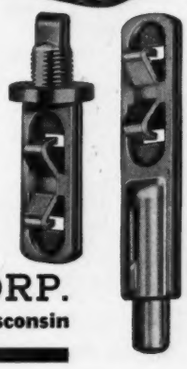

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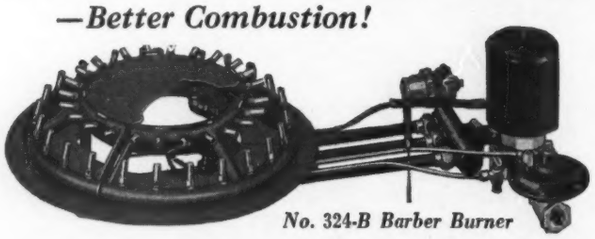

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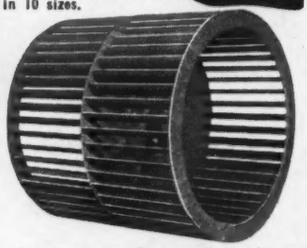

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UTAH: Ogden, warehouses, ordnance depot; **Hill Field,** Air Corps buildings; **Salt Lake City,** airport depot various buildings; **Utah General Depot,** Wendover Field, barracks, offices, warehouses, shops, mess halls, etc.; **Ft. Douglas,** barracks, warehouses, etc.; . . . **VERMONT: Ft. Ethan Allen,** new structures to supply shelter 5,000 men; **Bolton,** misc. buildings; **Jericho,** industrial buildings; **Underhill,** housing; **Colchester,** various military buildings; . . . **VIRGINIA: Bolling Field,** GHQ Air Force Headquarters new buildings of all kinds, housing; **Newport News,** ship building plant; **Arlington Cantonment,** new buildings; **Dahlgren,** Navy Air hangars; **Radford,** $50,000,000 munitions plant, housing; **Lee Hall,** housing; **Arlington,** housing; **Virginia Beach,** housing; **Langley Field,** new air depot buildings, housing; **Phoebus,** housing; **Yorktown,** $4,000,000 Navy munitions plant, housing; **Norfolk,** Navy

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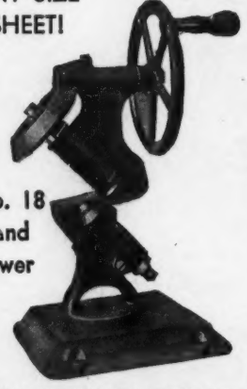

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VIRGIN ISLANDS: Frederiksted, miscellaneous Army buildings; **Charlotte Amalie,** Marine Corps Air Field buildings; **St. Thomas,** Navy and Army buildings, housing; . . . **WASHINGTON: South Tacoma,** housing; **Spokane,** airfield buildings, housing; **Ft. Lewis,** barracks, hospital, offices, mess halls, etc., $5,000,000 building job, housing; **Ft. Worden,** temporary buildings; **Seattle,** $8,000,000 aircraft plant expansion, naval air station, housing; **Bremerton Navy Yard,** buildings and utilities; **Puget Sound Naval Station,** housing; **McChord Field,** various buildings; **Bellingham Airport,** buildings; **Everett,** Snohomish Airport, Army buildings; **Sand Point Naval Air Station,** buildings, housing; **Naval Torpedo Station Bainbridge Island,** buildings, housing; **Seattle,** shipbuilding plant expansion, $5,000,000; **Vancouver Barracks,** expansion; **Ft. George Wright,** barracks, offices, quarters, etc.; **Ft. Lawton,** barracks, quarters, warehouses; . . .

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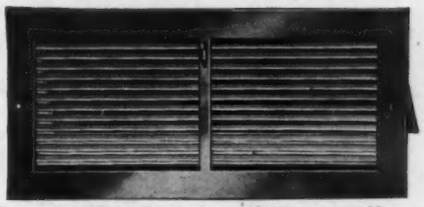

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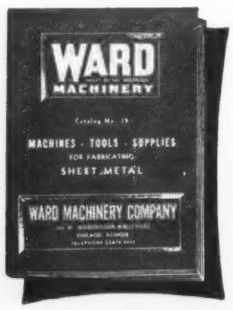

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News Items . . . . . .

The 40-Hour Week

Classifications of white collar employees who need not be paid overtime after 40 hours a week were re-defined today in amended regulations affecting almost all interstate commerce establishments by Colonel Philip B. Fleming, Administrator of the Wage and Hour Division, U. S. Department of Labor. The regulations go into effect October 24, 1940, the same day on which the standard workweek under the Fair Labor Standards Act (Federal Wage and Hour Law) becomes 40 hours.

Principal change in these regulations under the Act is a separate definition for "administrative" employee, heretofore defined together with "executive." An executive as defined remains one whose primary duty consists in management and who, among other qualifications, gets $30 a week or more. Administrative employees are more broadly defined in the new regulations to include those whose duties, while important and associated with management, are functional rather than supervisory, and who are paid "a salary commensurate with the importance supposedly accorded the duties in question." The regulations require that such a salary be not less than $200 a month.

"Protection for the typical white collar worker from inconsiderate exploitation as to his or her working hours will continue," said Colonel Fleming in issuing the new regulations. "Those workers will also continue to have the protection of Section 6 requiring that they be paid at least $12 for a 40-hour week, and in certain industries operating under wage orders establishing various higher minima, at least $13, $14, or $16 a week. With few exceptions, the employer representatives who testified at our 'white collar' hearings agreed that most clerical workers should have this protection. They asked that some impractical situations be solved. We feel that these new regulations solve them. They called to our attention instances of salaried employees with important functions whose work was difficult to measure in hours. Yet they did not come under our definition of 'executive (and) administrative' usually because they did not supervise other employees. The solution is this: If these employees work at non-manual assignments which require the exercise of discretion and independent judgment and if they receive $200 a month or more they need not record their hours or be paid overtime under the law.

"These amendments are not retroactive. The Division's original definition of 'executive (and) administrative' which was worked out at a conference attended among others by A. D. Whiteside, president of Dun & Bradstreet, Inc.; Newbold Noyes, publisher of **The Washington Star**; Robert Watt of the A. F. of L.; and John Abt of the Amalgamated Clothing Workers (C. I. O.), was a legal definition."

The provision in the original definition for executive which caused more questions than any other was the requirement that an executive do no substantial amount of the work done by his subordinates. The new regulations answer the question, "What is substantial?" "Substantial" means more than 20 percent on an hourly basis. Thus, a foreman listed on the payroll records as exempt from overtime because he comes under the "executive" definition, whose subordinates work 40 hours a week may work eight hours at the same kind of work. More than eight hours of such work would make him a working foreman and legally necessitate payment of at least time and a half his regular rate for his work in excess of 40 hours a week. Most representatives of industry at the four hearings were in agreement that the working foreman should be paid overtime.

The definition for an employee employed in a "professional" capacity and thereby exempt from overtime requirements has been broadened by including the artistic

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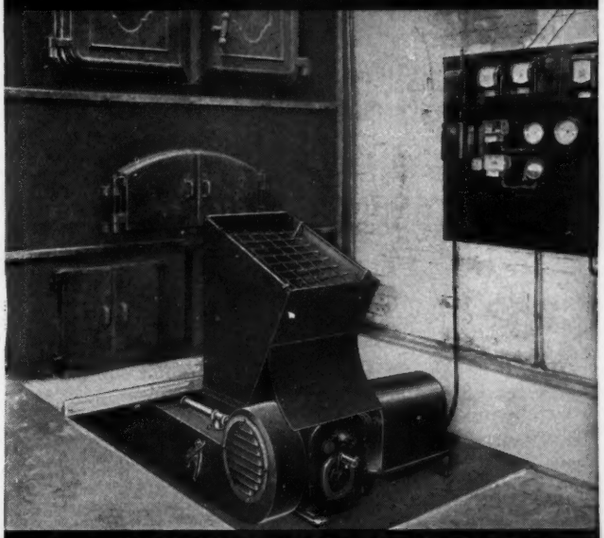

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"Builders of Good Stokers for 20 Years"

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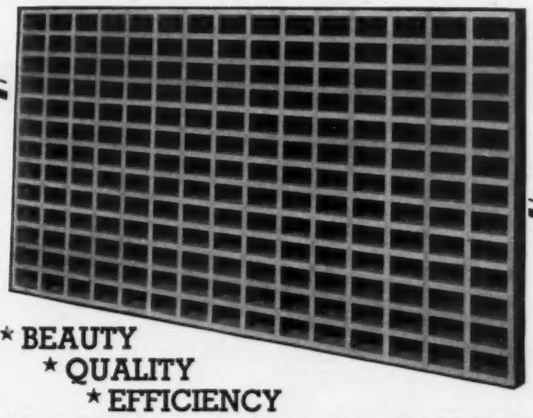

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QUALITY EQUIPMENT-- FROM HESS-- COSTS LESS

DEALERS---Write for our New 1941 Portfolio

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USE THE

JOHNSON No. 101 BENCH FURNACE

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It Needs No Blower

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It's designed for soldering coppers up to 12 lbs. per pair, and is the right furnace for heat-treating, annealing or case-hardening carbon steel tools. Curved shaped hood forces return blast over parts being heated. Has two Johnson Burners, shut-off valve, pilot light. Send for full free facts.

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Please send me full free information on No. 101 Johnson Furnace, and other Soldering Furnaces.

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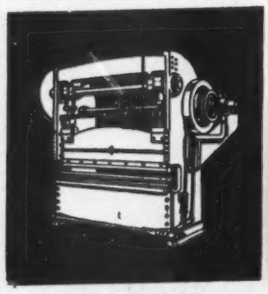

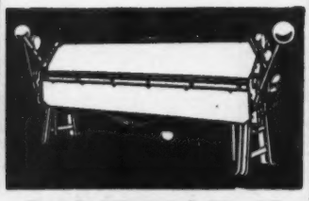

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Steel Brakes—Presses—Shears
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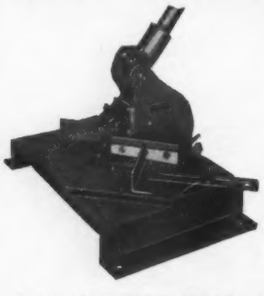
LITTLE BLACKSMITH No. 39
SHEET METAL NOTCHER
Capacity 5"x5"
90° Notch—20 Gauge



Saves time and hand work, produces work which will fit accurately.

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Any range 15 F.P.M. to 24,000 F.P.M.

TAKES JUST A MOMENT TO CHECK AIR VELOCITIES WITH THE

Alnor *ALL PURPOSE* **VELOMETER**

You can save time and know whether your heating and air conditioning jobs are right when you use the "ALNOR" Velometer. Without timing or complicated mathematical calculations the Velometer gives direct, accurate, instantaneous air velocity readings. Many users report that with the Velometer they can check and balance a system in one tenth the time formerly required, and the Velometer gives them a picture of air distribution that no other instrument can. Write for details.

ILLINOIS TESTING LABORATORIES, INC.
419 N. La Salle Street Chicago, Illinois

News Items . . . . . .

professions and narrowed by the requirement that the "professional" employee exempt from overtime requirements must be paid $200 a month or more. The $200 salary requirement does not apply to licensed members of the legal and medical professions. Under the regulations, there is no legal obligation to pay graduate chemists, engineers, etc., $200 a month. But if they are not paid $200 a month, they must be paid time and a half for all work over 40 hours a week.

The definition of "outside salesman" is broadened to exempt from minimum wage and overtime pay requirements "driver-salesmen." It is further amended to assure the exemption of advertising solicitors selling publication and radio advertising contracts and freight solicitors.

◆

Yardstick for the Evaluation of a Forced Warm Air System

The 4th draft of the "Yardstick for the Evaluation of a Forced Warm Air System" was presented by Professor Konzo at the meeting of the Board of Directors of the National Warm Air Heating and Air Conditioning Association at the Palmer House, Chicago, October 3.

Various points of the Yardstick were brought up for discussion. A few suggestions and changes, and additions mere made. With the slight changes and additions, the Board voted unanimously to accept the Yardstick, directing that every possible effort be made to have it published and ready for distribution at the 27th annual convention to be held at the Hotel Statler, Detroit, December 10th and 11th.

The Yardstick will contain 24 pages of letterhead size. It will be produced in quantities and every effort will be made to hold the price as low as possible. This document presents a substantial contribution to the industry because it will create higher standards of installation practice.

Obituary

Frank Staar

Frank Staar, 82, founder of Frank Staar & Sons, Inc., Chicago, passed away on October 4 at Hollywood, California.

Mr. Staar was born on March 21, 1858, at Stadt Schlaining, near Vienna, Austria. At 8 years of age, on the death of his father, he went to Hungary and at 12 years of age became apprenticed for 4 years to a sheet metal firm in Oedenburg, without wages, but fed and clothed as was the custom with indentured apprentices. The working hours were 12 and often 14 a day. There was very little machinery in those days and most of the bending was done by hand.

Before Mr. Staar became a journeyman, he had to make a piece of work which was very closely examined by the trade's master. On their recommendation, he became a journeyman and had to join the trades union (not to be compared with unions of the present time). There was a drawing school where cutting was also taught and the older members instructed the younger. As a journeyman, he travelled from city to city on foot.

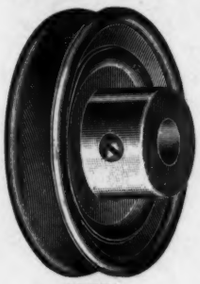
In Vienna, Austria, Mr. Staar was employed in one of the largest shops where he had a chance to enrich his knowledge on ornamental work in zinc, copper and brass. He married in Vienna in 1879 at the age of 21, and arrived in Chicago on June 12, 1884, with a wife and two children. Four years later he started the firm of Frank Staar & Sons, Inc., now managed by his sons.

A story of the hand-made copper ship weathervane made by Mr. Staar and atop the old Board of Trade building for some 45 years, and now in custody of the Board of Trade American Legion Post, was recorded in the February 23, 1929 issue of American Artisan.

Mr. Staar was the oldest member of the United Roofing Contractors Association.

COMPARE MAUREY V-PULLEYS

With Any V-Pulleys Made



STEEL

VARIABLE PITCH

CAST IRON

. . . and you will readily see why so many builders of high grade Air Conditioning and Refrigeration Units, Blowers, Fans and Stokers find that MAUREY V-PULLEYS save time and money.

MAUREY STEEL V-PULLEYS are designed and built to give maximum service. Made of heavy steel with machined steel or malleable hubs —not die cast.

MAUREY VARIABLE PITCH PULLEYS of cast iron construction. Speed adjustment of as much as 30%. Fine, accurate, milled threads, 20 to the inch assure close adjustments. In 5 sizes—3¼" to 5½" O. D. For Air Conditioning Units.

MAUREY CAST IRON V-PULLEYS are made on a new principle of design that permits freer flow of air through spokes. Balanced and true-running, they are much sturdier than pulleys of the usual design. Grooves machined to micrometer accuracy.

Send for Circulars and Prices.

MAUREY MANUFACTURING CORP.
Wabash at 29th, Chicago, Illinois

But—Those Fall Service Jobs Can Bring You MORE Profits!

GET THEM WITH THERMO-DRIP HEAT REGULATED HUMIDIFIERS

Alright . . . You get dozens of calls for furnace cleaning and resets. And you can sell smoke pipe, grate bars and firepots to most of the homeowners who need that service.

Just a minute, though — *Are you getting worthwhile profits out of those service jobs?*

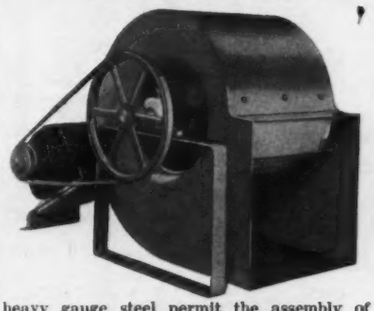
Every furnace in your community needs a THERMO-DRIP Automatic Humidifier to make it a more efficient performer. Each of those furnaces gives you the opportunity to get the EXTRA profits you want. Just talk up these low cost, trouble-free humidifiers on every trip to your customers' basements and make your Fall Service Jobs pay! Try it.

Ask Your Wholesaler or Write Us for Details

AUTOMATIC HUMIDIFIER CO.
18th and Main Streets **CEDAR FALLS, IOWA**

THERMO-DRIP
Automatic **HUMIDIFIER**

BLOWER WHEELS, HOUSINGS, ASSEMBLIES



Fan assemblies and wheels for every forced warm air heating and air conditioning need.

The complete assembly is offered in 11 standard sizes. Top mounted motor with adjustable base or bottom mounted motor with automatic belt adjustment are available.

Bishop and Babcock Blower Wheels in ten diameters in widths from 3" up; meet any capacity demand at any operating speed.

Housings constructed of heavy gauge steel permit the assembly of bearing or motor supports directly on the housing without auxilliary supports. Any width in single or double inlet design.

Write for Bulletin 87 giving full data including capacities or have Bishop and Babcock engineers submit recommendations for your requirements.

TERRITORIES AVAILABLE FOR REPRESENTATIVES

The BISHOP & BABCOCK MFG. CO.
CLEVELAND, OHIO.
REPRESENTATIVES IN PRINCIPAL CITIES

"THINKING OF FIRST COST OR FINAL COST?"

Often the first cost of a dependable temperature control is no more than that of one that may leak, or weaken. In any case it is seldom more than a trifle higher. But what a difference in final cost to you!

You who sell and install heating units or air conditioning systems know how easily extra service costs can eat up your profits. Such extra costs are seldom necessary. They can be largely eliminated by seeing that your controls are actuated by Chace High Temperature Thermostatic Bimetals — designed and engineered specifically for your type of work.

Foremost manufacturers produce the controls in which Chace bimetals are used. If you want to be sure that your service costs will be cut to the minimum—and that your customers will get long time trouble-free performance—specify Chace High Temperature.

Specify Chace

Control manufacturers are invited to consult us for type of Chace Thermostatic Bimetal best suited to meet specific demands.

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NEW HOME OF
CONGRESS DRIVES

Over 400 sizes of Congress Drives are manufactured and stocked in this new factory—America's finest die casting plant. You get the best in materials, workmanship and delivery when you specify "Congress Drives."

Samples to rated concerns for test purposes. Catalog on request.

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PORTABLE SHEARS
ALL-ALLOY

ALL-ALLOY No. 2 cuts up to ¼" steel plate.
ALL-ALLOY No. 1 cuts up to No. 11 gauge strip or sheet.
Special blades may be had for shearing stainless steel.

FULLY GUARANTEED

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SELL MORE FURNACES
with this NEW LOW PRICE
Breuer's Ball Bearing
TORNADO
Furnace and Boiler Vacuum Cleaner

Not only does it excel in furnace and boiler cleaning, but it puts you directly in touch with the furnace and repair needs of your customer. Not a converted household cleaner, but DESIGNED FOR THE JOB. Complete set of necessary attachments.

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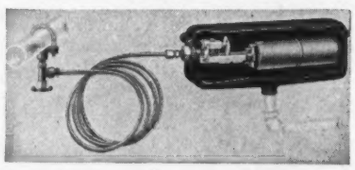
Tomorrow's humidifier valve .... today!

HERE'S the end of your humidifying troubles—a float valve with a new snap action that prevents plugging up or sticking open. Snaps open wide when water drops ¼-inch in pan; snaps to leak-tight closure against any water pressure when water level is restored. Has greater capacity—withstands high temperature—doesn't wire draw or corrode. Write for engineering data proving its superiority.



McDONNELL & MILLER
1318 Wrigley Building, Chicago, Ill.

The New McDONNELL Humidifier Water Control

News Items . . . . . .

Gas Appliance Manufacturers Meet

The Association of Gas Appliance and Equipment Manufacturers held its annual meeting at the Hotel Claridge in Atlantic City, N. J., on October 7.

W. E. Derwent, vice-president of the Geo. D. Roper Corp., of Rockford, Ill., was elected president, succeeding Frank H. Adams, vice-president of the Surface Combustion Corp., of Toledo, Ohio. Mr. Derwent has been active in the gas industry for the past thirty-five years. He is a director of the American Gas Association and a past president of the Mid-West Gas Association. Up until his election as president, Mr. Derwent was chairman of the Association's Domestic Gas Range Division.

Following a meeting of the Gas House Heating and Air Conditioning Equipment Division, it was announced that eleven manufacturers had agreed to finance a national sales promotion program in 1941 for gas fired furnaces somewhat similar in scope to the current "CP" Gas Range activity.

◆

Free Sheet Metal Courses

The Federal Government, through the Chicago Board of Education, offers free sheet metal courses at Englewood Evening School, Shop Building, 62nd & Princeton Avenue, Chicago.

Courses are open to those employed in the trade, or in a related occupation. Students may take general, or specialized sheet metal shop, and layout work. Skill and technique are improved through this organized and graded course under a skilled and practical teacher, Frederick Hansen, a practical man well known to the trade.

There are no deposits or fees of any kind. Classes meet Tuesday, Thursday and Friday at 6:30 p. m. to 9:50 p. m. and Saturday from 8:00 a. m. to 4:30 p. m.

The employer who can induce his men to take this up-to-the-minute practical course, will get a more skilled and efficient worker. The employee who will attend this class, will gain in technique and knowledge, and will be enabled to earn a promotion.

Matthew L. Fitzgerald, Principal.

◆

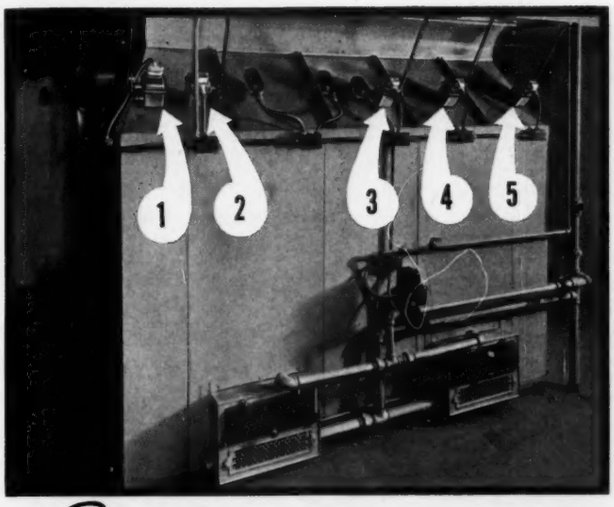
Warm Air in Defense Specifications

(*Continued from page 29*)

period of extreme activity.

Whereas a limited number of manufacturers have equipment meeting the army camp specifications for size and whereas only a limited number of contractors may have the financial status equal to these $250,000 upward contracts—practically every manufacturer in the industry and practically every well established, financially responsible contractor can handle some part of the housing heating contracts.

For these reasons the housing contracts let and to be let should be of paramount interest to us. This industry wants housing to be warm air heated. Acceptance by those who have final say, we now have. Acceptance to the end of the program we can keep only if every housing installation is designed and installed as this industry knows it should be. It should be the aim, then, of every manufacturer, engineer, contractor to see that housing heating systems meet our highest standards.



Zone DAMPER CONTROL

Five zones in a large residence are supplied by this gas-fired warm air furnace. Each zone is independently controlled, and the desired temperature is maintained by means of mixing dampers located above the furnace bonnet.

Electric DAMPER MOTORS

Zone thermostats govern the proper positioning of the five Damper Motors shown in the picture. An outstanding example of the usefulness, flexibility, and accuracy of the Barber-Colman System. Write for data.

BARBER-COLMAN COMPANY
ROCKFORD • ILLINOIS

NOT A DROP OF SATURATION HERE—*NEARLY A 100% VIRGIN FIELD*

NEW PROFITS

$39.50

The public is fast learning that improper humidification . . . hot, dry air is a health menace and a destroyer of furnishings. You can profitably sell the HUMIDOME, the perfect humidifier that appeals to every home and office. Investigate NOW.

Humidome **NATIONAL ADVERTISING IS JUST BEGINNING**

For liberal dealer discounts and complete proposition write

THE HARRY ALTER CO.
1728 S. MICHIGAN AVE. CHICAGO, ILL.

G&O RADIATION

FINNED COILS

FOR HEATING AND COOLING

AVAILABLE IN A WIDE RANGE OF SIZES

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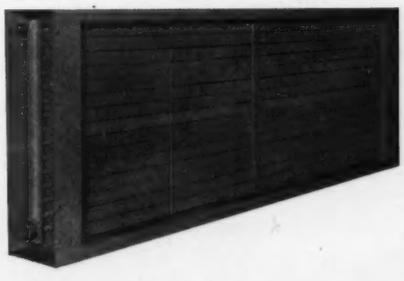

WATER COOLING COILS

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New Haven, Connecticut
Pioneer Manufacturers of Square Finned Tubing in the United States

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SELL MRS. O'GRADY OR THE COLONEL'S LADY FROM PEERLESS LINE . . .

Peerless dealers have units which appeal to every class of buyer—from cottage to mansion. Starting with unusual values in cast iron and steel round furnaces, the line includes the most modern winter air conditioners for completely automatic operation with coal, coke, oil or gas. Prices and discounts are extremely liberal, to insure quick sales and fast profits.

Get our proposition TODAY.

PEERLESS FOUNDRY CO., 1853 Ludlow Ave., Indianapolis, Ind.

FURNACE REPAIRS

A FULL STOCK

Every kind of repair part to fit that you may need is ready, awaiting your order at Central. Central parts make repair jobs easier, and easier repairs mean more profits. Write for full information and catalogue today.

CENTRAL
FURNACE & STOVE REPAIR CO.
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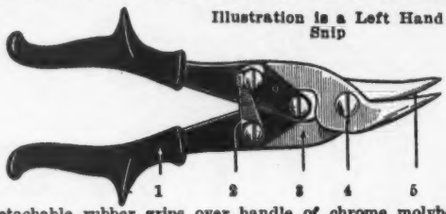
KLENK'S Double Action Aviation Snips

Illustration is a Left Hand Snip



1. Detachable rubber grips over handle of chrome molybdenum steel
2. Adjustable lock
3. Special hardened alloy steel. Tensile strength 8500 lb.
4. A. & H. Standard bolts
5. Curved jaws for cutting ends of tubing to .065 in. wall

BIG VALUE—LOW COST—A trial will convince you. Made for both right and left hand—straight or curves—Easy to work—Order today.

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Elgo Ventilating Specialties

Motor-Operated Shutter

A shutter that operates by remote control. Just turn a switch and the shutters open to a 90-degree angle, closing tight when the switch is turned off. A popular shutter for attic fan installations—also for industrial and commercial use. Equipped with motor, transformer and relay. Sizes from 12" to 60" square—also rectangular.

Get our prices on Automatic, Stationary and Hand Operated Shutters, also Ceiling, Balanced and Back Draft Dampers.

Free CATALOG

ELGO SHUTTER & MANUFACTURING CO.
634 W. Warren Detroit, Mich.

Essential Requirements For Oil Burner Installation

(*Continued from page* 48)

flame. If a change in the air adjustment is necessary, make the change and allow the burner to operate a few minutes more with the door closed before again inspecting the flame. The burner cannot be adjusted properly with the furnace door open because of the air which enters the combustion chamber through the door.

After the final adjustments have been made on the burner, a final checkup on the installation as a whole should be made. All pipe connections should be inspected for leaks. Furnace doors should be inspected to see that they are tightly fitted. The controls should be watched through two or more cycles of operation to make sure they are functioning properly.

After all the foregoing has been completed, all excess material and muss created by the installation should be cleaned up. This will take but little time and will leave the owner with a good impression.

Most important is that all instructions furnished by the burner and control manufacturers be carefully read and followed.

◆

Sheet Metal Training Courses

(*Continued from page* 74)

agricultural instruction. It is expected that these shops and programs, operated in the States under the authority of State Boards for Vocational Education, will be expanded and adapted to prepare rural youth for service in the national defense program.

The first $50,000,000 appropriation was made on representation by the U. S. Office of Education that the vocational schools of this country had buildings and equipment available for carrying on the program in its initial stages this past summer. This, of course, was only a beginning and as needs for training have increased there has been an urgent necessity for expanding the vocational school facilities. Defense needs have already taxed the training capacities of local schools in certain places where training is essential to the defense program. In some cases the fiscal situation of the schools will not permit quick acquisition of sufficient equipment to meet the needs of defense training. It is for these reasons that Congress has appropriated $8,000,000 for equipment in trade schools to help meet such emergencies. Seven and one-half million dollars are appropriated for vocational and related and other instruc-

PERFORATED METALS

Every Sheet Metal Worker needs perforated metal in one form or another.

For processing food products and to withstand certain chemicals, perforated Stainless Steel and Monel Metal are much used.

Factory Safety Guards—For this service perforated metal has no equal.

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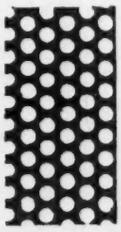

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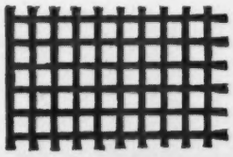

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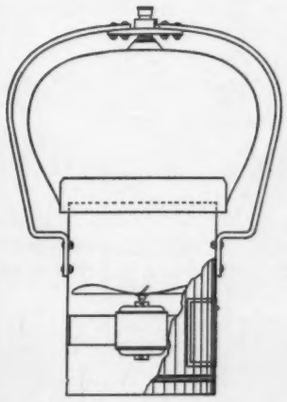

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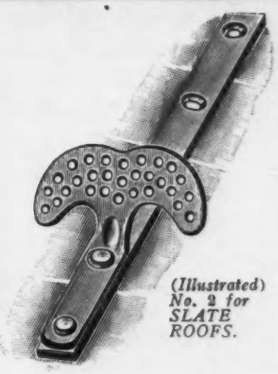

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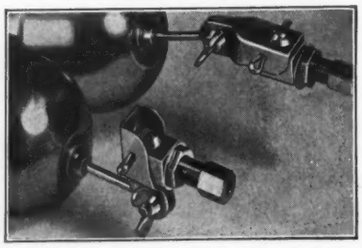

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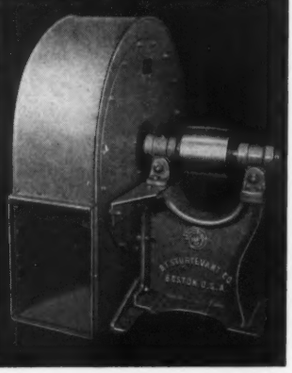

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Technical Code—Precalculated

(*Continued from page* 35)

the next installment we will start designing a forced warm air system by the Technical Code with the aid of the tables and charts. To simplify and unify the discussion, a typical plan will be selected and used until the system is completely designed.

These articles will not constitute a Technical Code heating course in six easy lessons. It is assumed that the articles will be read by experienced heating men who already have a general understanding of the code or other basic methods of calculating and who approve of the principles of the code and have a copy of it available, but are interested in ways and means of shortening the time required to apply it without eliminating any of its essentials.

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FRANK K. CANNON, Manager

RATES FROM $2 SINGLE $3.50 DOUBLE!

How To Collect Past Due Accounts

(*Continued from page 72*)

absolutely necessary if he wishes to avoid unpleasant consequences.

Keep a close check upon returns from the letters. If a debtor pays, or gives satisfactory evidence that he will pay later, stop sending letters at once. This point should be watched very carefully.

Sometimes, with certain classes of people, certain letters will have a much better effect than others. Check the returns on the letters, so that you will know which of them pull the best results. If you find one of the letters seems to have little effect, it is possible that you can analyze it and make some little change that will strengthen it. In the main, however, these letters should be effective for the average business.

Contract-Specification Form

F. E. Mehrings, Chairman of the Publicity and Mercandising Committee, was asked at the recent meeting of the Board of Directors of the National Warm Air Heating and Air Conditioning Association to prepare a standard Contract-Specification Form. This form will tie into the Yardstick and it is possible that the Yardstick will become a part of the Contract-Specification Form. The completed Contract-Specification Form will be presented at the next Board meeting, prior to the December Annual Convention.

MEMO

FROM: Sales Manager TO: Adv. Manager

Please make a note of the important message about January 1941 in the November issue of AMERICAN ARTISAN.

P. J. D.

. . it's on the inside back cover

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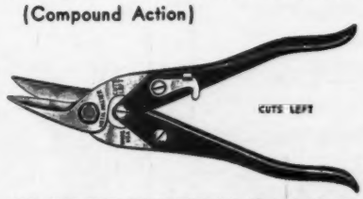

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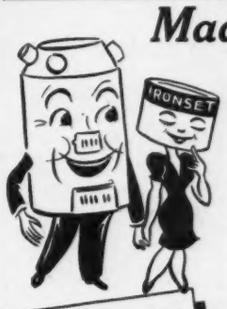

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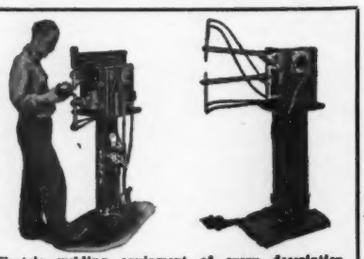

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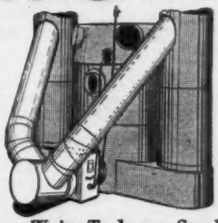
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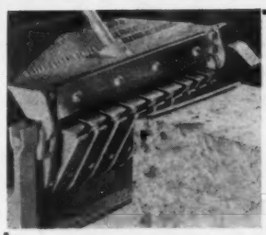
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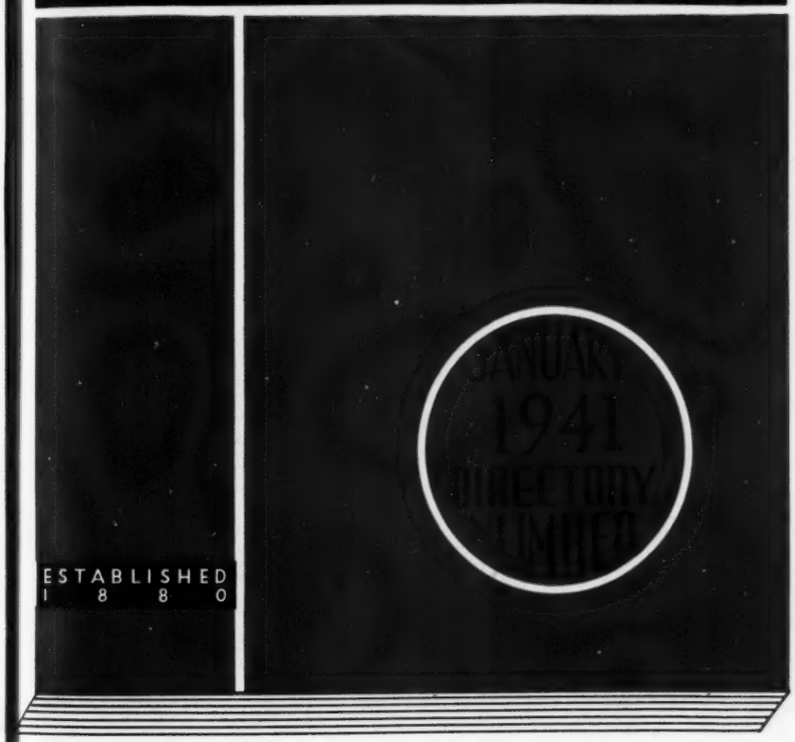

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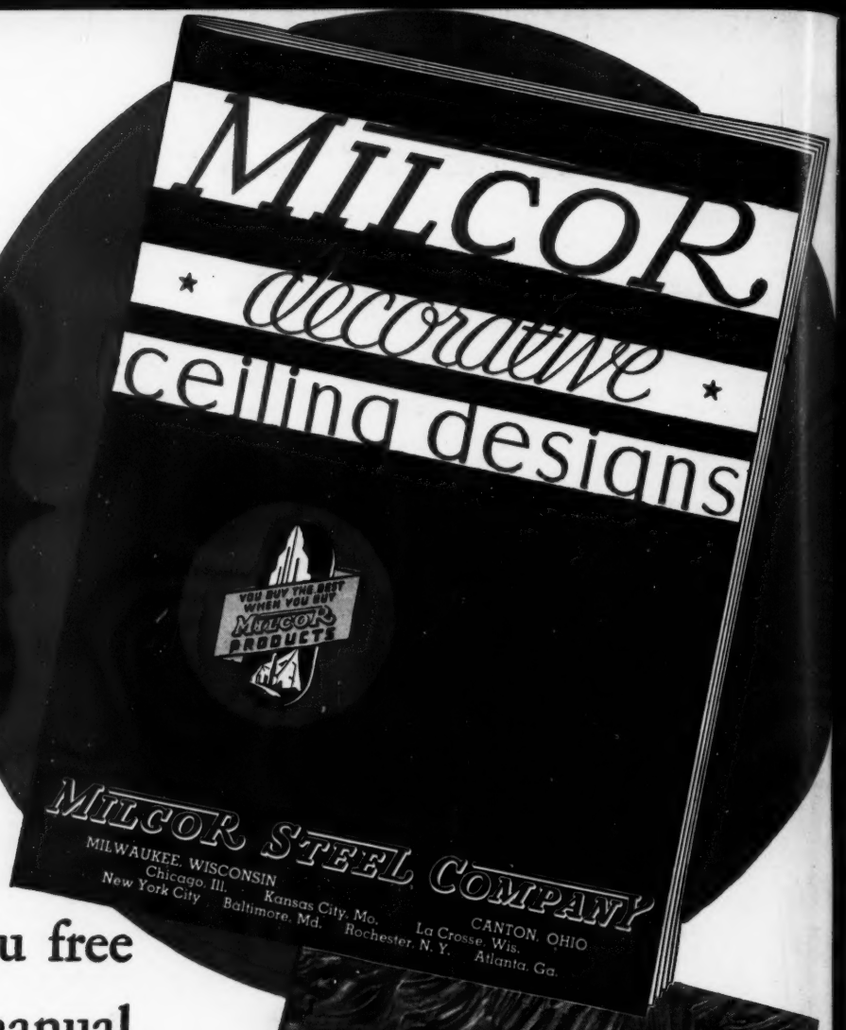

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